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Supplementary Material to:

The Influence of Differential Peer Associations on Delinquency Varies Depending on the Combination of Unstructured Socializing and Personal Morals

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This supplementary material includes the sensitivity analyses for the main article "The influence of differential peer associations on delinquency varies depending on the combination of unstructured socializing and personal morals". It presents results that were calculated from the following models:

1. Multilevel negative binomial model with inverse softplus link (delinquency information from subsequent wave)
2. Multilevel negative binomial model with inverse softplus link (uncapped delinquency)
3. Multilevel negative binomial model with inverse softplus link (delinquency versatility)
4. Multilevel negative binomial model with log link
5. Multilevel Poisson model with inverse softplus link
6. Multilevel Poisson model with log link
7. Multilevel OLS model (with identity link)
8. Multilevel negative binomial model with inverse softplus link (+ self-control)

In the subsequent sections, the results will be presented with tables and figures without any further comments or interpretations. The names of the subsections and the type of figures and tables resemble those of the main article.

https://doi.org10.18716/ojs/krimoj/2021.1.1.6

1. Multilevel negative binomial model with inverse softplus link (delinquency information from subsequent wave)

1.1 Model formula

$$
\begin{aligned}
\text{Delinquency\_t+1}_i &\sim \text{NegBin}(\mu_i, \phi) && \text{[Likelihood]}\\
\text{invsoftplus}(\mu_i) &= \alpha_{ID[i]} + && \text{[Varying intercept]}\\
&\quad \beta_1\,\text{DiffPeers}_i + && \text{[Main effects]}\\
&\quad \beta_2\,\text{US\_Low-Risk}_i + \beta_3\,\text{US\_Medium-Risk}_i + \beta_4\,\text{US\_High-Risk}_i +\\
&\quad \beta_5\,\text{PMorals}_i +\\
&\quad \beta_6\,\text{Year\_2004}_i + \beta_7\,\text{Year\_2005}_i + \beta_8\,\text{Year\_2006}_i +\\
&\quad \beta_9\,\text{DiffPeers}_i * \text{US\_Low-Risk}_i + && \text{[Two-way interactions]}\\
&\quad \beta_{10}\,\text{DiffPeers}_i * \text{US\_Medium-Risk}_i + \beta_{11}\,\text{DiffPeers}_i * \text{US\_High-Risk}_i +\\
&\quad \beta_{12}\,\text{DiffPeers}_i * \text{PMorals}_i +\\
&\quad \beta_{13}\,\text{US\_Low-Risk}_i * \text{PMorals}_i + \beta_{14}\,\text{US\_Medium-Risk}_i * \text{PMorals}_i +\\
&\quad \beta_{15}\,\text{US\_High-Risk}_i * \text{PMorals}_i +\\
&\quad \beta_{16}\,\text{DiffPeers}_i * \text{US\_Low-Risk}_i * \text{PMorals}_i + && \text{[Three-way interactions]}\\
&\quad \beta_{17}\,\text{DiffPeers}_i * \text{US\_Medium-Risk}_i * \text{PMorals}_i +\\
&\quad \beta_{18}\,\text{DiffPeers}_i * \text{US\_High-Risk}_i * \text{PMorals}_i\\
\phi &\sim \text{Exponential}(1) && \text{[Prior for shape parameter phi]}\\
\alpha_{ID} &\sim \text{Normal}(\bar{\alpha}, \sigma) && \text{[Adaptive prior]}\\
\bar{\alpha} &\sim \text{Normal}(0, 10) && \text{[Prior for average person]}\\
\sigma &\sim \text{Normal}(0, 10) && \text{[Prior for standard deviation of persons]}\\
\beta_k &\sim \text{Normal}(0, 5) && \text{[Prior for all k = 1 ... 18 beta coefficients]}
\end{aligned}
$$

Note: i = individual observation (ranges from i = 1 ... 8,603); ID = ID of each person (ranges from i = 1 ... 3,190); DiffPeers = Differential peer associations; US_Low-Risk = Unstructured socializing: Low-risk; US_Medium-Risk = Unstructured socializing: Medium-risk; US_High-Risk = Unstructured socializing: High-risk; PMorals = Personal morals; Year_2004 = Panel wave 2004; Year_2005 = Panel wave 2005; Year_2006 = Panel wave 2006.

1.2 The average peer effect

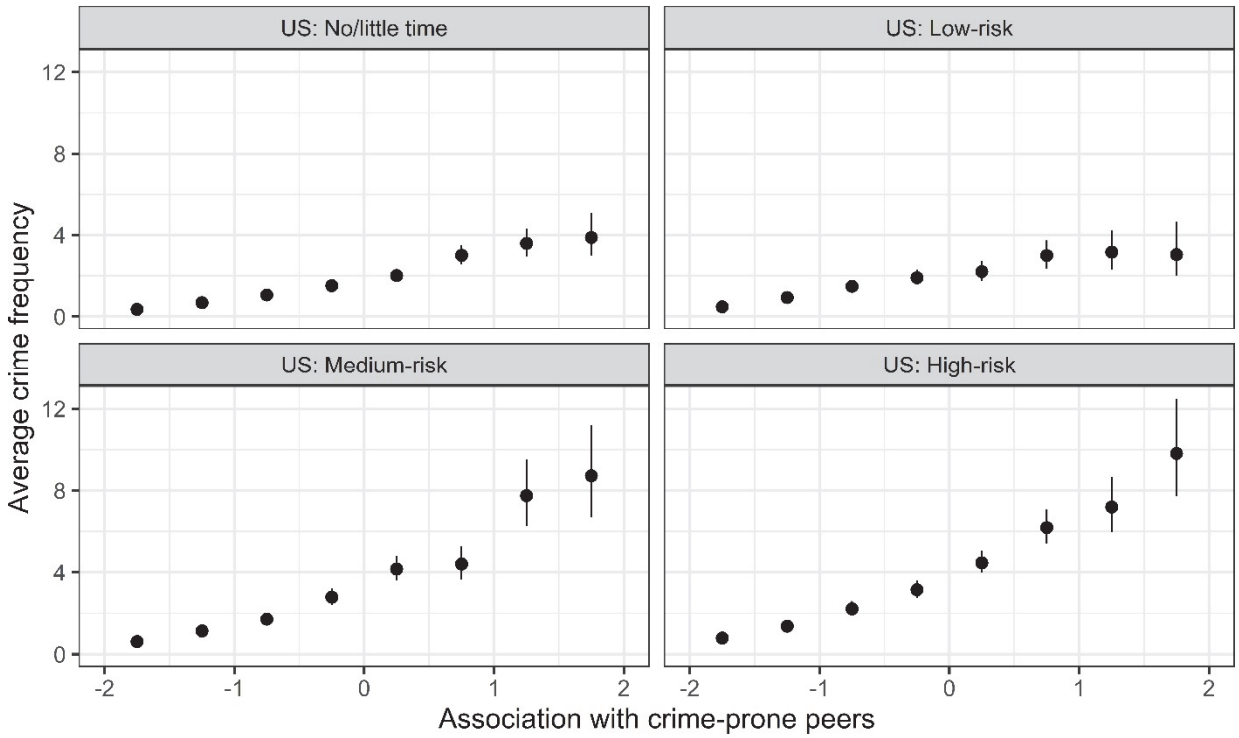
Table 1: Average marginal effects (main effects)

	AME
Differential peer associations	0.26 [0.19 0.34]
Unstructured socializing	
(ref. cat.: No/little time)	
Low-risk	0.05 [-0.17 0.28]
Medium-risk	0.77 [0.51 1.05]
High-risk	0.84 [0.58 1.11]
Personal morals	-0.44 [-0.53 -0.37]
Panel wave	
(ref. cat.: 2003)	
2004	-0.89 [-1.13 -0.66]
2005	-1.32 [-1.57 -1.08]
2006	-1.77 [-2.03 -1.54]
N (interviews)	8,603

Note: The numbers in the brackets reflect 95% credible intervals.

1.3 How peer effects vary depending on unstructured socializing

Figure 1: Predictions of average crime frequencies (peer associations x unstructured socializing)



Note: The plot shows how the predictions of average crime frequencies vary along the dimension of differential peer associations, contingent on unstructured socializing. The black dots and lines reflect point and 95% credible interval predictions. The focal peer association variable was categorized into eight evenly spaced subsets (-2 to -1.5, -1.5 to -1, ..., 1.5 to 2) to predict the average crime frequencies with the observed-value approach. US = Unstructured socializing.

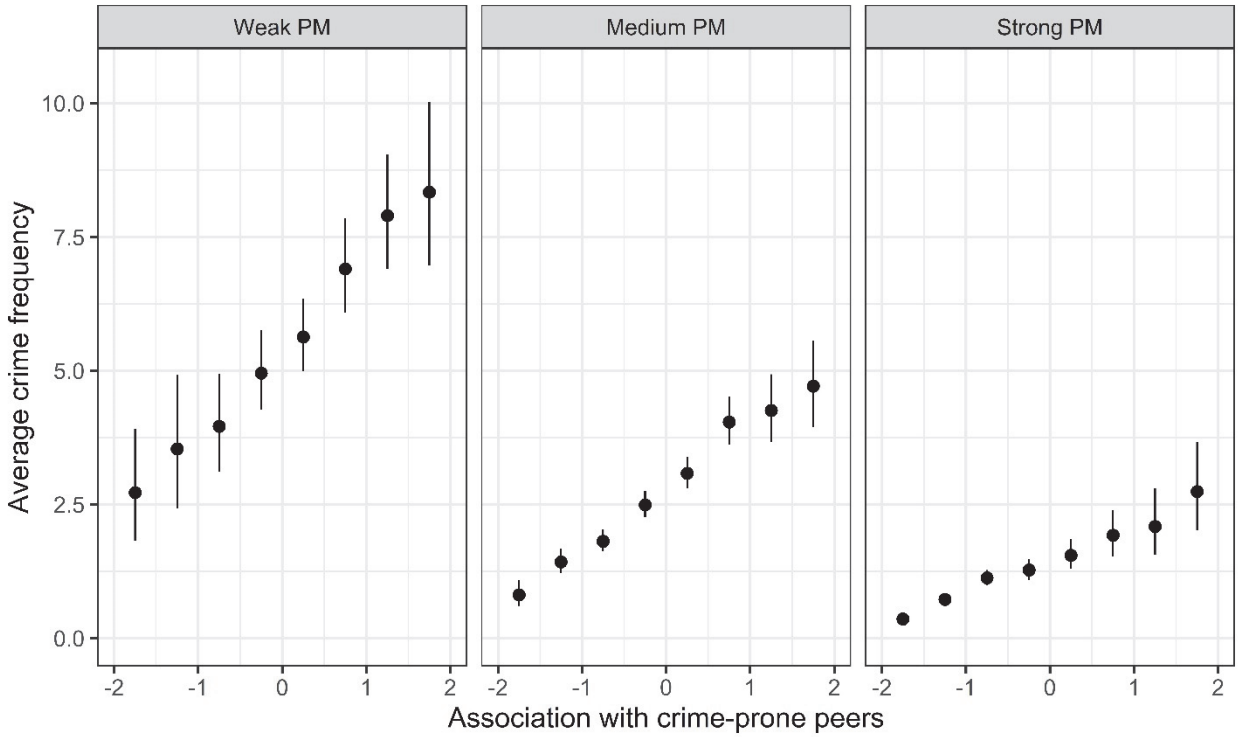
Table 2: Average marginal effects (of peer associations, contingent on unstructured socializing)

Unstructured socializing	**N**	**AME**	**Second differences**		
			No/little time	**Low-risk**	**Medium-risk**
No/little time	3,584	0.19 [0.12 0.27]			
Low-risk	1,655	0.16 [0.06 0.28]	-0.02 [-0.14 0.11]		
Medium-risk	1,727	0.41 [0.23 0.60]	0.22 [0.02 0.42]	0.24 [0.04 0.46]	
High-risk	1,637	0.37 [0.15 0.61]	0.19 [-0.05 0.43]	0.21 [-0.04 0.47]	-0.03 [-0.31 0.24]

Note: The second differences reflect the difference between the AMEs of the subgroups in the first column of the table and the AMEs of the particular subset in the last three columns. The numbers in the brackets reflect 95% credible intervals.

1.4 How peer effects vary depending on personal morals

Figure 2: Predictions of average crime frequencies (peer associations x personal morals)



Note: The plot shows how the predictions of average crime frequencies vary along the dimension of differential peer associations, contingent on personal morals. The black dots and lines reflect point and 95% credible interval predictions. The focal peer association variable was categorized into eight evenly spaced subsets (-2 to -1.5, -1.5 to -1, …, 1.5 to 2) to predict the average crime frequencies with the observed-value approach. PM = Personal morals.

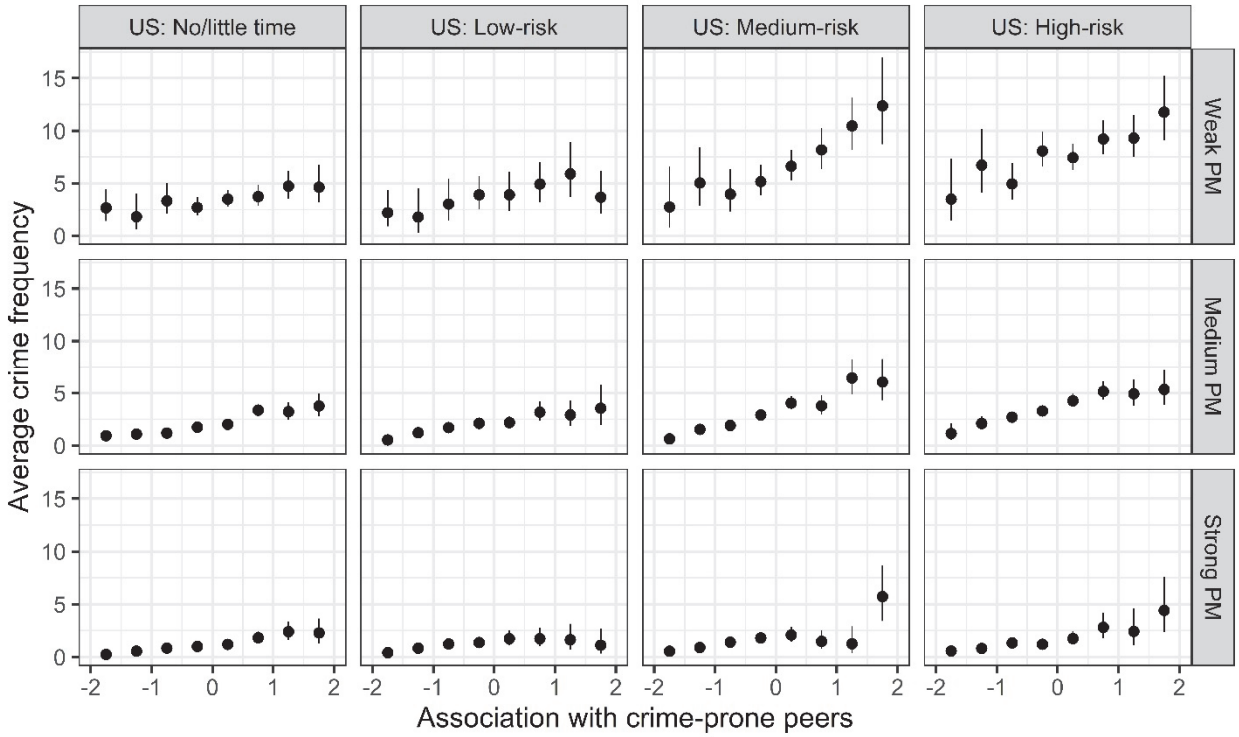
Table 3: Average marginal effects (of peer associations, contingent on personal morals)

Personal morals			**Second differences**	
	N	**AME**	**Medium**	**Strong**
Weak	840	0.55 [0.26 0.85]	0.21 [-0.01 0.44]	0.39 [0.10 0.69]
Medium	3,145	0.34 [0.25 0.44]		0.18 [0.10 0.26]
Strong	4,618	0.16 [0.12 0.21]		

Note: The second differences reflect the difference between the AMEs of the subgroups in the first column of the table and the AMEs of the particular subset in the last three columns. The numbers in the brackets reflect 95% credible intervals.

1.5 How peer effects vary depending on unstructured socializing and personal morals

Figure 3: Predictions of average crime frequencies (peer associations x unstructured socializing x personal morals)



Note: The plot shows how the predictions of average crime frequencies vary along the dimension of differential peer associations, contingent on the combination of unstructured socializing and personal morals. The black dots and lines reflect point and 95% credible interval predictions. The focal peer association variable was categorized into eight evenly spaced subsets (-2 to -1.5, -1.5 to -1, ..., 1.5 to 2) to predict the average crime frequencies with the observed-value approach. US = Unstructured socializing. PM = Personal morals.

Table 4: Average marginal effects (of peer associations, contingent on unstructured socializing and personal morals)

Unstructured socializing	Personal morals	N	AME
No/little time	Weak	283	0.22 [-0.07 0.60]
Low-risk	Weak	102	0.21 [-0.15 0.66]
Medium-risk	Weak	164	1.15 [0.56 1.78]
High-risk	Weak	291	0.63 [0.03 1.28]
No/little time	Medium	1,165	0.24 [0.14 0.36]
Low-risk	Medium	468	0.20 [0.06 0.36]
Medium-risk	Medium	742	0.50 [0.29 0.74]
High-risk	Medium	770	0.41 [0.18 0.65]
No/little time	Strong	2,136	0.15 [0.10 0.21]
Low-risk	Strong	1,085	0.15 [0.06 0.24]
Medium-risk	Strong	821	0.17 [0.05 0.30]
High-risk	Strong	576	0.19 [0.07 0.33]

Note: The numbers in the brackets reflect 95% credible intervals.

Table 5: Second (AME) differences (of peer associations, contingent on unstructured socializing and personal morals)

Group 1		Group 2		Second Differences
Unstructured socializing	Personal morals	Unstructured socializing	Personal morals	(AME_{Group1} -AME_{Group2})
High-risk	Weak	Medium-risk	Weak	-0.51 [-1.38 0.34]
High-risk	Weak	High-risk	Medium	0.22 [-0.23 0.71]
High-risk	Weak	Low-risk	Weak	0.42 [-0.33 1.14]
High-risk	Weak	Medium-risk	Medium	0.13 [-0.52 0.80]
High-risk	Weak	No/little time	Weak	0.40 [-0.29 1.13]
High-risk	Weak	Low-risk	Medium	0.43 [-0.19 1.10]
High-risk	Weak	High-risk	Strong	0.44 [-0.17 1.11]
High-risk	Weak	No/little time	Medium	0.39 [-0.22 1.06]
High-risk	Weak	Medium-risk	Strong	0.46 [-0.15 1.12]
High-risk	Weak	Low-risk	Strong	0.49 [-0.12 1.14]
High-risk	Weak	No/little time	Strong	0.48 [-0.12 1.14]
Medium-risk	Weak	High-risk	Medium	0.73 [0.12 1.42]
Medium-risk	Weak	Low-risk	Weak	0.93 [0.24 1.67]
Medium-risk	Weak	Medium-risk	Medium	0.64 [0.20 1.13]
Medium-risk	Weak	No/little time	Weak	0.92 [0.24 1.63]
Medium-risk	Weak	Low-risk	Medium	0.95 [0.35 1.60]
Medium-risk	Weak	High-risk	Strong	0.95 [0.37 1.60]
Medium-risk	Weak	No/little time	Medium	0.90 [0.32 1.55]
Medium-risk	Weak	Medium-risk	Strong	0.97 [0.39 1.62]
Medium-risk	Weak	Low-risk	Strong	1.00 [0.40 1.64]
Medium-risk	Weak	No/little time	Strong	1.00 [0.41 1.63]
High-risk	Medium	Low-risk	Weak	0.20 [-0.31 0.65]
High-risk	Medium	Medium-risk	Medium	-0.09 [-0.41 0.22]
High-risk	Medium	No/little time	Weak	0.19 [-0.24 0.57]
High-risk	Medium	Low-risk	Medium	0.21 [-0.06 0.50]
High-risk	Medium	High-risk	Strong	0.22 [0.04 0.42]
High-risk	Medium	No/little time	Medium	0.17 [-0.08 0.43]
High-risk	Medium	Medium-risk	Strong	0.24 [-0.03 0.51]
High-risk	Medium	Low-risk	Strong	0.27 [0.01 0.53]
High-risk	Medium	No/little time	Strong	0.26 [0.03 0.51]
Low-risk	Weak	Medium-risk	Medium	-0.29 [-0.73 0.19]
Low-risk	Weak	No/little time	Weak	-0.02 [-0.53 0.51]

Group 1		Group 2		Second Differences
Unstructured socializing	**Personal morals**	**Unstructured socializing**	**Personal morals**	**(AME_{Group1} - AME_{Group2})**
Low-risk	Weak	Low-risk	Medium	0.01 [-0.25 0.37]
Low-risk	Weak	High-risk	Strong	0.01 [-0.37 0.49]
Low-risk	Weak	No/little time	Medium	-0.03 [-0.41 0.43]
Low-risk	Weak	Medium-risk	Strong	0.04 [-0.35 0.51]
Low-risk	Weak	Low-risk	Strong	0.06 [-0.29 0.53]
Low-risk	Weak	No/little time	Strong	0.05 [-0.31 0.51]
Medium-risk	Medium	No/little time	Weak	0.28 [-0.14 0.64]
Medium-risk	Medium	Low-risk	Medium	0.30 [0.04 0.58]
Medium-risk	Medium	High-risk	Strong	0.31 [0.07 0.57]
Medium-risk	Medium	No/little time	Medium	0.26 [0.02 0.52]
Medium-risk	Medium	Medium-risk	Strong	0.33 [0.17 0.52]
Medium-risk	Medium	Low-risk	Strong	0.36 [0.12 0.61]
Medium-risk	Medium	No/little time	Strong	0.35 [0.12 0.60]
No/little time	Weak	Low-risk	Medium	0.03 [-0.29 0.42]
No/little time	Weak	High-risk	Strong	0.03 [-0.28 0.42]
No/little time	Weak	No/little time	Medium	-0.02 [-0.23 0.28]
No/little time	Weak	Medium-risk	Strong	0.05 [-0.26 0.45]
No/little time	Weak	Low-risk	Strong	0.08 [-0.22 0.47]
No/little time	Weak	No/little time	Strong	0.07 [-0.23 0.45]
Low-risk	Medium	High-risk	Strong	0.01 [-0.19 0.20]
Low-risk	Medium	No/little time	Medium	-0.04 [-0.22 0.14]
Low-risk	Medium	Medium-risk	Strong	0.03 [-0.17 0.22]
Low-risk	Medium	Low-risk	Strong	0.05 [-0.05 0.017]
Low-risk	Medium	No/little time	Strong	0.05 [-0.10 0.21]
High-risk	Strong	No/little time	Medium	-0.05 [-0.22 0.11]
High-risk	Strong	Medium-risk	Strong	0.02 [-0.16 0.20]
High-risk	Strong	Low-risk	Strong	0.04 [-0.11 0.21]
High-risk	Strong	No/little time	Strong	0.04 [-0.09 0.17]
No/little time	Medium	Medium-risk	Strong	0.07 [-0.09 0.24]
No/little time	Medium	Low-risk	Strong	0.09 [-0.04 0.24]
No/little time	Medium	No/little time	Strong	0.09 [0.00 0.18]
Medium-risk	Strong	Low-risk	Strong	0.02 [-0.13 0.18]
Medium-risk	Strong	No/little time	Strong	0.02 [-0.11 0.16]
Low-risk	Strong	No/little time	Strong	-0.01 [-0.11 0.10]

Note: The groups are sorted by the size of their respective AME from the main article (see *Table 4* in main article). The numbers in the brackets reflect 95% credible intervals.

2. Multilevel negative binomial model with inverse softplus link (uncapped delinquency)

2.1 Model formula

$$
\begin{aligned}
\text{Delinquency\_uncap}_i &\sim \text{NegBin}(\mu_i, \phi) && \text{[Likelihood]}\\
\text{invsoftplus}(\mu_i) &= \alpha_{ID[i]} + && \text{[Varying intercept]}\\
&\quad \beta_1\,\text{DiffPeers}_i + && \text{[Main effects]}\\
&\quad \beta_2\,\text{US\_Low-Risk}_i + \beta_3\,\text{US\_Medium-Risk}_i + \beta_4\,\text{US\_High-Risk}_i +\\
&\quad \beta_5\,\text{PMorals}_i +\\
&\quad \beta_6\,\text{Year\_2004}_i + \beta_7\,\text{Year\_2005}_i + \beta_8\,\text{Year\_2006}_i +\\
&\quad \beta_9\,\text{DiffPeers}_i * \text{US\_Low-Risk}_i + && \text{[Two-way interactions]}\\
&\quad \beta_{10}\,\text{DiffPeers}_i * \text{US\_Medium-Risk}_i + \beta_{11}\,\text{DiffPeers}_i * \text{US\_High-Risk}_i +\\
&\quad \beta_{12}\,\text{DiffPeers}_i * \text{PMorals}_i +\\
&\quad \beta_{13}\,\text{US\_Low-Risk}_i * \text{PMorals}_i + \beta_{14}\,\text{US\_Medium-Risk}_i * \text{PMorals}_i +\\
&\quad \beta_{15}\,\text{US\_High-Risk}_i * \text{PMorals}_i +\\
&\quad \beta_{16}\,\text{DiffPeers}_i * \text{US\_Low-Risk}_i * \text{PMorals}_i + && \text{[Three-way interactions]}\\
&\quad \beta_{17}\,\text{DiffPeers}_i * \text{US\_Medium-Risk}_i * \text{PMorals}_i +\\
&\quad \beta_{18}\,\text{DiffPeers}_i * \text{US\_High-Risk}_i * \text{PMorals}_i\\
\phi &\sim \text{Exponential}(1) && \text{[Prior for shape parameter phi]}\\
\alpha_{ID} &\sim \text{Normal}(\bar{\alpha}, \sigma) && \text{[Adaptive prior]}\\
\bar{\alpha} &\sim \text{Normal}(0, 10) && \text{[Prior for average person]}\\
\sigma &\sim \text{Normal}(0, 10) && \text{[Prior for standard deviation of persons]}\\
\beta_k &\sim \text{Normal}(0, 5) && \text{[Prior for all k = 1 … 18 beta coefficients]}
\end{aligned}
$$

Note: i = individual observation (ranges from i = 1 … 9,654); ID = ID of each person (ranges from i = 1 … 3,290); DiffPeers = Differential peer associations; US_Low-Risk = Unstructured socializing: Low-risk; US_Medium-Risk = Unstructured socializing: Medium-risk; US_High-Risk = Unstructured socializing: High-risk; PMorals = Personal morals; Year_2004 = Panel wave 2004; Year_2005 = Panel wave 2005; Year_2006 = Panel wave 2006.

2.2 The average peer effect

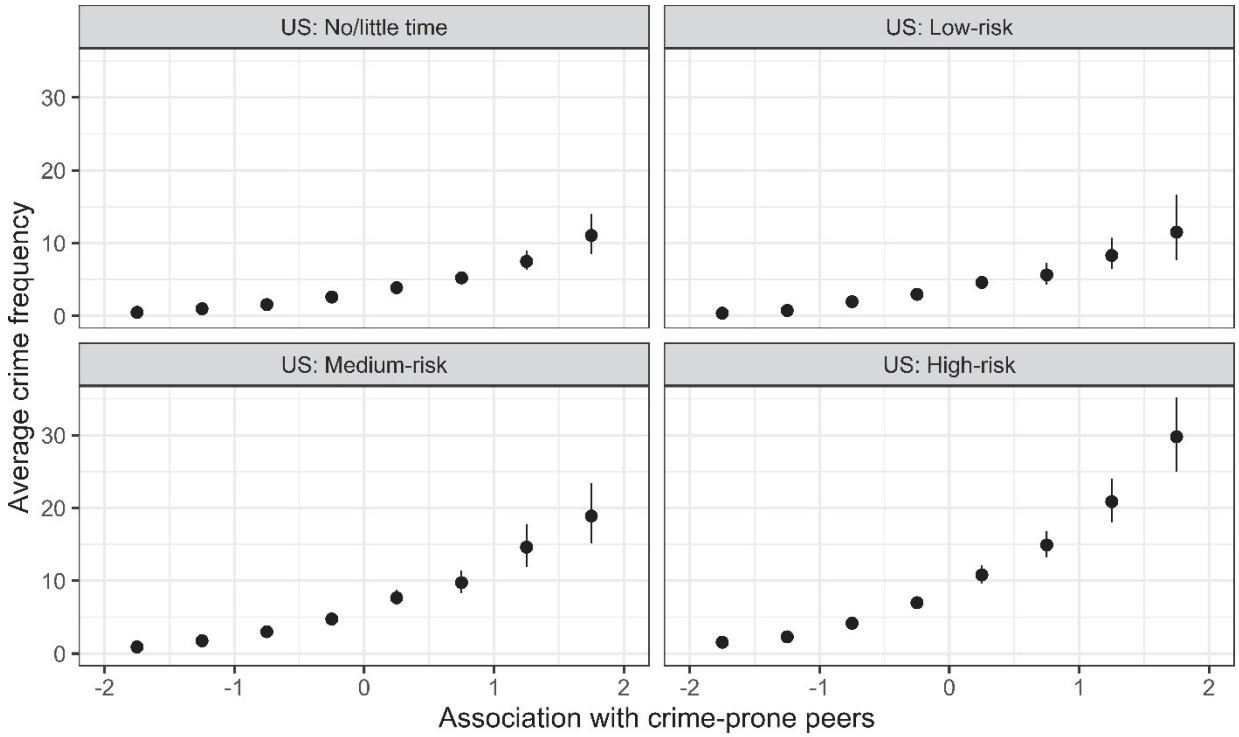
Table 6: Average marginal effects (main effects)

	AME
Differential peer associations	0.82 [0.69 0.94]
Unstructured socializing (ref. cat.: No/little time)	
Low-risk	-0.02 [-0.46 0.46]
Medium-risk	1.38 [0.94 1.88]
High-risk	2.60 [2.07 3.17]
Personal morals	-1.18 [-1.33 -1.04]
Panel wave (ref. cat.: 2003)	
2004	-0.59 [-0.90 -0.24]
2005	-1.19 [-1.51 -0.87]
2006	-1.65 [-2.01 -1.34]
N (interviews)	9,654

Note: The numbers in the brackets reflect 95% credible intervals.

2.3 How peer effects vary depending on unstructured socializing

Figure 4: Predictions of average crime frequencies (peer associations x unstructured socializing)



Note: The plot shows how the predictions of average crime frequencies vary along the dimension of differential peer associations, contingent on unstructured socializing. The black dots and lines reflect point and 95% credible interval predictions. The focal peer association variable was categorized into eight evenly spaced subsets (-2 to -1.5, -1.5 to -1, ..., 1.5 to 2) to predict the average crime frequencies with the observed-value approach. US = Unstructured socializing.

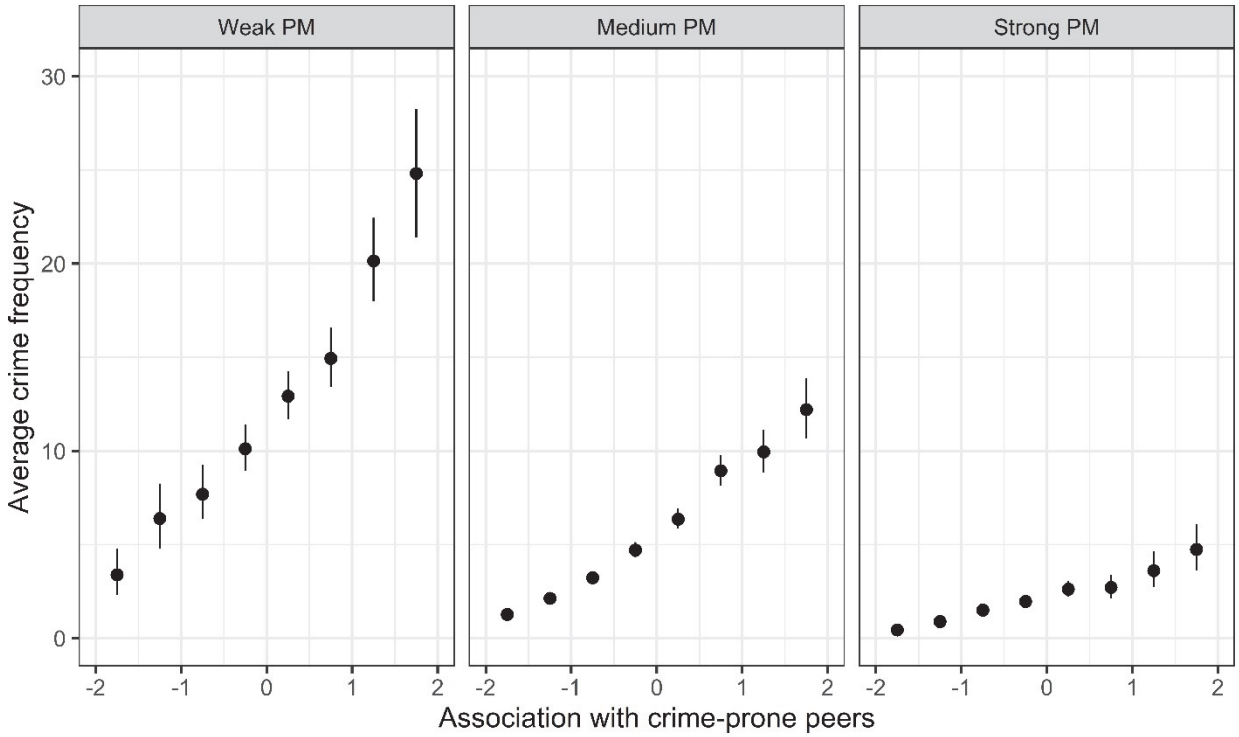
Table 7: Average marginal effects (of peer associations, contingent on unstructured socializing)

Unstructured socializing	**N**	**AME**	**Second differences**		
			No/little time	**Low-risk**	**Medium-risk**
No/little time	4,065	0.40 [0.28 0.53]			
Low-risk	1,833	0.60 [0.42 0.79]	0.20 [-0.01 0.42]		
Medium-risk	1,936	1.07 [0.78 1.37]	0.67 [0.36 0.98]	0.47 [0.12 0.82]	
High-risk	1,820	1.69 [1.25 2.15]	1.29 [0.85 1.76]	1.09 [0.61 1.58]	0.63 [0.10 1.16]

Note: The second differences reflect the difference between the AMEs of the subgroups in the first column of the table and the AMEs of the particular subset in the last three columns. The numbers in the brackets reflect 95% credible intervals.

2.4 How peer effects vary depending on personal morals

Figure 5: Predictions of average crime frequencies (peer associations x personal morals)



Note: The plot shows how the predictions of average crime frequencies vary along the dimension of differential peer associations, contingent on personal morals. The black dots and lines reflect point and 95% credible interval predictions. The focal peer association variable was categorized into eight evenly spaced subsets (-2 to -1.5, -1.5 to -1, …, 1.5 to 2) to predict the average crime frequencies with the observed-value approach. PM = Personal morals.

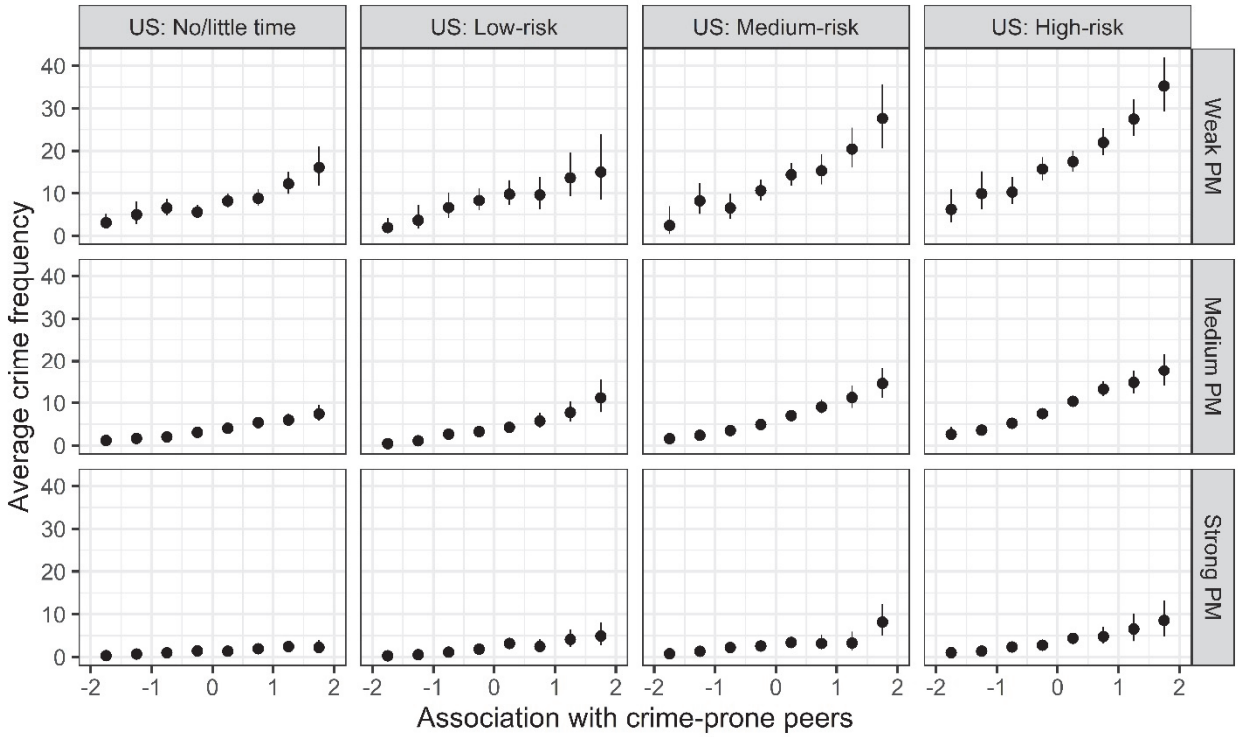
Table 8: Average marginal effects (of peer associations, contingent on personal morals)

Personal morals			**Second differences**	
	N	**AME**	**Medium**	**Strong**
Weak	973	2.34 [1.84 2.85]	1.22 [0.83 1.60]	2.02 [1.51 2.54]
Medium	3,529	1.13 [0.95 1.31]		0.81 [0.65 0.97]
Strong	5,152	0.31 [0.25 0.39]		

Note: The second differences reflect the difference between the AMEs of the subgroups in the first column of the table and the AMEs of the particular subset in the last three columns. The numbers in the brackets reflect 95% credible intervals.

2.5 How peer effects vary depending on unstructured socializing and personal morals

Figure 6: Predictions of average crime frequencies (peer associations x unstructured socializing x personal morals)



Note: The plot shows how the predictions of average crime frequencies vary along the dimension of differential peer associations, contingent on the combination of unstructured socializing and personal morals. The black dots and lines reflect point and 95% credible interval predictions. The focal peer association variable was categorized into eight evenly spaced subsets (-2 to -1.5, -1.5 to -1, ..., 1.5 to 2) to predict the average crime frequencies with the observed-value approach. US = Unstructured socializing. PM = Personal morals.

Table 9: Average marginal effects (of peer associations, contingent on unstructured socializing and personal morals)

Unstructured socializing	Personal morals	N	AME
No/little time	Weak	336	1.35 [0.76 2.00]
Low-risk	Weak	127	1.57 [0.59 2.70]
Medium-risk	Weak	176	2.93 [1.90 4.04]
High-risk	Weak	334	3.29 [2.22 4.39]
No/little time	Medium	1,327	0.58 [0.39 0.77]
Low-risk	Medium	521	0.89 [0.59 1.23]
Medium-risk	Medium	852	1.38 [1.01 1.78]
High-risk	Medium	829	1.88 [1.40 2.39]
No/little time	Strong	2,402	0.17 [0.10 0.24]
Low-risk	Strong	1,185	0.36 [0.24 0.52]
Medium-risk	Strong	908	0.41 [0.22 0.63]
High-risk	Strong	657	0.63 [0.37 0.93]

Note: The numbers in the brackets reflect 95% credible intervals.

Table 10: Second (AME) differences (of peer associations, contingent on unstructured socializing and personal morals)

Group 1		Group 2		Second Differences (AME_{Group1} -AME_{Group2})
Unstructured socializing	Personal morals	Unstructured socializing	Personal morals	
High-risk	Weak	Medium-risk	Weak	0.36 [-1.17 1.83]
High-risk	Weak	High-risk	Medium	1.41 [0.68 2.17]
High-risk	Weak	Low-risk	Weak	1.73 [0.22 3.19]
High-risk	Weak	Medium-risk	Medium	1.92 [0.77 3.06]
High-risk	Weak	No/little time	Weak	1.93 [0.70 3.20]
High-risk	Weak	Low-risk	Medium	2.40 [1.30 3.54]
High-risk	Weak	High-risk	Strong	2.65 [1.56 3.79]
High-risk	Weak	No/little time	Medium	2.72 [1.63 3.81]
High-risk	Weak	Medium-risk	Strong	2.89 [1.78 4.01]
High-risk	Weak	Low-risk	Strong	2.93 [1.84 4.03]
High-risk	Weak	No/little time	Strong	3.12 [2.04 4.21]
Medium-risk	Weak	High-risk	Medium	1.04 [-0.07 2.26]
Medium-risk	Weak	Low-risk	Weak	1.36 [-0.15 2.83]
Medium-risk	Weak	Medium-risk	Medium	1.54 [0.80 2.34]
Medium-risk	Weak	No/little time	Weak	1.57 [0.45 2.82]
Medium-risk	Weak	Low-risk	Medium	2.03 [0.97 3.22]
Medium-risk	Weak	High-risk	Strong	2.30 [1.22 3.45]
Medium-risk	Weak	No/little time	Medium	2.34 [1.33 3.47]
Medium-risk	Weak	Medium-risk	Strong	2.51 [1.45 3.68]
Medium-risk	Weak	Low-risk	Strong	2.56 [1.54 3.70]
Medium-risk	Weak	No/little time	Strong	2.75 [1.73 3.88]
High-risk	Medium	Low-risk	Weak	0.32 [-0.91 1.42]
High-risk	Medium	Medium-risk	Medium	0.50 [-0.13 1.14]
High-risk	Medium	No/little time	Weak	0.53 [-0.28 1.32]
High-risk	Medium	Low-risk	Medium	0.98 [0.42 1.58]
High-risk	Medium	High-risk	Strong	1.24 [0.85 1.66]
High-risk	Medium	No/little time	Medium	1.30 [0.79 1.84]
High-risk	Medium	Medium-risk	Strong	1.46 [0.95 2.02]
High-risk	Medium	Low-risk	Strong	1.52 [1.01 2.04]
High-risk	Medium	No/little time	Strong	1.71 [1.22 2.22]
Low-risk	Weak	Medium-risk	Medium	0.20 [-0.89 1.37]

Group 1		Group 2		Second Differences (AME_{Group1} -AME_{Group2})
Unstructured socializing	**Personal morals**	**Unstructured socializing**	**Personal morals**	
Low-risk	Weak	No/little time	Weak	0.22 [-0.91 1.41]
Low-risk	Weak	Low-risk	Medium	0.68 [-0.08 1.52]
Low-risk	Weak	High-risk	Strong	0.93 [-0.13 2.08]
Low-risk	Weak	No/little time	Medium	0.99 [-0.01 2.12]
Low-risk	Weak	Medium-risk	Strong	1.16 [0.14 2.31]
Low-risk	Weak	Low-risk	Strong	1.21 [0.19 2.37]
Low-risk	Weak	No/little time	Strong	1.40 [0.41 2.54]
Medium-risk	Medium	No/little time	Weak	0.04 [-0.67 0.73]
Medium-risk	Medium	Low-risk	Medium	0.49 [-0.02 0.99]
Medium-risk	Medium	High-risk	Strong	0.75 [0.27 1.22]
Medium-risk	Medium	No/little time	Medium	0.80 [0.39 1.23]
Medium-risk	Medium	Medium-risk	Strong	0.96 [0.63 1.34]
Medium-risk	Medium	Low-risk	Strong	1.01 [0.61 1.62]
Medium-risk	Medium	No/little time	Strong	1.21 [0.83 1.62]
No/little time	Weak	Low-risk	Medium	0.46 [-0.19 1.15]
No/little time	Weak	High-risk	Strong	0.72 [0.05 1.41]
No/little time	Weak	No/little time	Medium	0.77 [0.31 1.28]
No/little time	Weak	Medium-risk	Strong	0.94 [0.29 1.60]
No/little time	Weak	Low-risk	Strong	0.98 [0.36 1.64]
No/little time	Weak	No/little time	Strong	1.18 [0.58 1.84]
Low-risk	Medium	High-risk	Strong	0.26 [-0.18 0.68]
Low-risk	Medium	No/little time	Medium	0.31 [-0.03 0.68]
Low-risk	Medium	Medium-risk	Strong	0.48 [0.11 0.87]
Low-risk	Medium	Low-risk	Strong	0.52 [0.25 0.87]
Low-risk	Medium	No/little time	Strong	0.72 [0.42 1.06]
High-risk	Strong	No/little time	Medium	0.05 [-0.27 0.42]
High-risk	Strong	Medium-risk	Strong	0.22 [-0.11 0.56]
High-risk	Strong	Low-risk	Strong	0.27 [-0.03 0.60]
High-risk	Strong	No/little time	Strong	0.47 [0.20 0.77]
No/little time	Medium	Medium-risk	Strong	0.17 [-0.12 0.44]
No/little time	Medium	Low-risk	Strong	0.21 [-0.02 0.44]
No/little time	Medium	No/little time	Strong	0.41 [0.26 0.58]
Medium-risk	Strong	Low-risk	Strong	0.05 [-0.20 0.30]
Medium-risk	Strong	No/little time	Strong	0.24 [0.04 0.47]
Low-risk	Strong	No/little time	Strong	0.19 [0.05 0.36]

Note: The groups are sorted by the size of their respective AME from the main article (see *Table 4* in main article). The numbers in the brackets reflect 95% credible intervals.

3. Multilevel negative binomial model with inverse softplus link (delinquency versatility)

3.1 Model formula

$$
\begin{aligned}
\text{Delinquency\_versat}_i &\sim \text{NegBin}(\mu_i, \phi) && \text{[Likelihood]}\\
\text{invsoftplus}(\mu_i) &= \alpha_{ID[i]} + && \text{[Varying intercept]}\\
&\beta_1\,\text{DiffPeers}_i + && \text{[Main effects]}\\
&\beta_2\,\text{US\_Low-Risk}_i + \beta_3\,\text{US\_Medium-Risk}_i + \beta_4\,\text{US\_High-Risk}_i +\\
&\beta_5\,\text{PMorals}_i +\\
&\beta_6\,\text{Year\_2004}_i + \beta_7\,\text{Year\_2005}_i + \beta_8\,\text{Year\_2006}_i +\\
&\beta_9\,\text{DiffPeers}_i * \text{US\_Low-Risk}_i + && \text{[Two-way interactions]}\\
&\beta_{10}\,\text{DiffPeers}_i * \text{US\_Medium-Risk}_i + \beta_{11}\,\text{DiffPeers}_i * \text{US\_High-Risk}_i +\\
&\beta_{12}\,\text{DiffPeers}_i * \text{PMorals}_i +\\
&\beta_{13}\,\text{US\_Low-Risk}_i * \text{PMorals}_i + \beta_{14}\,\text{US\_Medium-Risk}_i * \text{PMorals}_i +\\
&\beta_{15}\,\text{US\_High-Risk}_i * \text{PMorals}_i +\\
&\beta_{16}\,\text{DiffPeers}_i * \text{US\_Low-Risk}_i * \text{PMorals}_i + && \text{[Three-way interactions]}\\
&\beta_{17}\,\text{DiffPeers}_i * \text{US\_Medium-Risk}_i * \text{PMorals}_i +\\
&\beta_{18}\,\text{DiffPeers}_i * \text{US\_High-Risk}_i * \text{PMorals}_i\\
\phi &\sim \text{Exponential}(1) && \text{[Prior for shape parameter phi]}\\
\alpha_{ID} &\sim \text{Normal}(\bar{\alpha}, \sigma) && \text{[Adaptive prior]}\\
\bar{\alpha} &\sim \text{Normal}(0, 5) && \text{[Prior for average person]}\\
\sigma &\sim \text{Normal}(0, 5) && \text{[Prior for standard deviation of persons]}\\
\beta_k &\sim \text{Normal}(0, 2) && \text{[Prior for all k = 1 … 18 beta coefficients]}
\end{aligned}
$$

Note: i = individual observation (ranges from i = 1 … 10,048); ID = ID of each person (ranges from i = 1 … 3,322); DiffPeers = Differential peer associations; US_Low-Risk = Unstructured socializing: Low-risk; US_Medium-Risk = Unstructured socializing: Medium-risk; US_High-Risk = Unstructured socializing: High-risk; PMorals = Personal morals; Year_2004 = Panel wave 2004; Year_2005 = Panel wave 2005; Year_2006 = Panel wave 2006.

3.2 The average peer effect

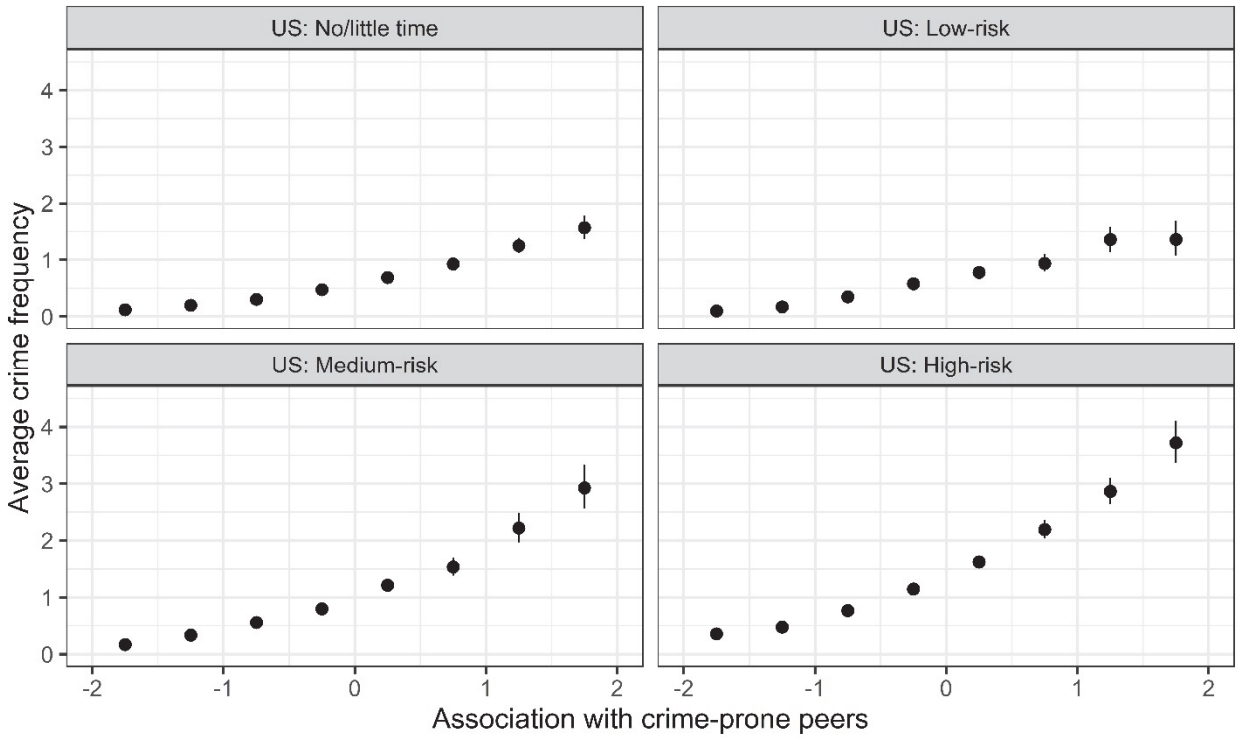
Table 11: Average marginal effects (main effects)

	AME
Differential peer associations	0.11 [0.09 0.12]
Unstructured socializing	
(ref. cat.: No/little time)	
Low-risk	-0.03 [-0.08 0.02]
Medium-risk	0.19 [0.14 0.24]
High-risk	0.36 [0.31 0.42]
Personal morals	-0.17 [-0.19 -0.16]
Panel wave	
(ref. cat.: 2003)	
2004	-0.17 [-0.23 -0.12]
2005	-0.30 [-0.35 -0.24]
2006	-0.40 [-0.45 -0.35]
N (interviews)	10,048

Note: The numbers in the brackets reflect 95% credible intervals.

3.3 How peer effects vary depending on unstructured socializing

Figure 7: Predictions of average crime frequencies (peer associations x unstructured socializing)



Note: The plot shows how the predictions of average crime frequencies vary along the dimension of differential peer associations, contingent on unstructured socializing. The black dots and lines reflect point and 95% credible interval predictions. The focal peer association variable was categorized into eight evenly spaced subsets (-2 to -1.5, -1.5 to -1, ..., 1.5 to 2) to predict the average crime frequencies with the observed-value approach. US = Unstructured socializing.

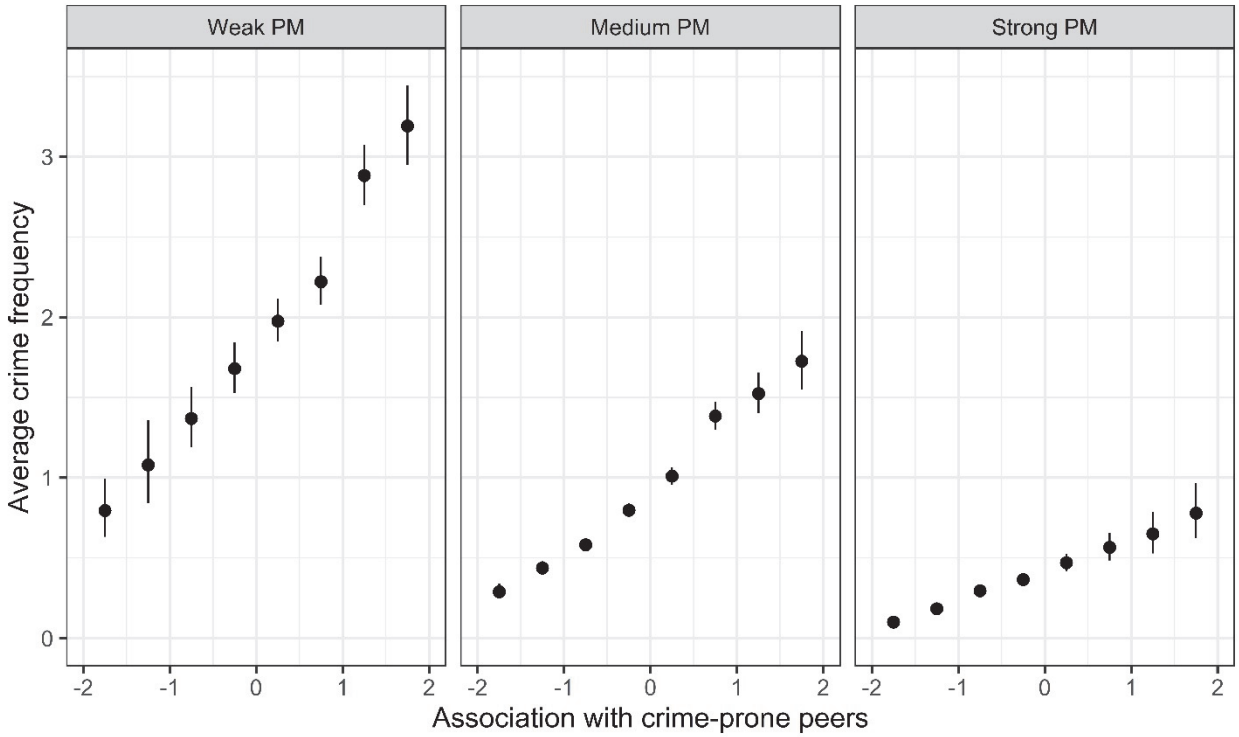
Table 12: Average marginal effects (of peer associations, contingent on unstructured socializing)

Unstructured socializing	**N**	**AME**	**Second differences**		
			No/little time	**Low-risk**	**Medium-risk**
No/little time	4,179	0.07 [0.05 0.08]			
Low-risk	1,882	0.09 [0.07 0.12]	0.02 [0.00 0.05]		
Medium-risk	2,026	0.15 [0.11 0.18]	0.08 [0.04 0.12]	0.05 [0.01 0.10]	
High-risk	1,961	0.18 [0.13 0.23]	0.11 [0.06 0.16]	0.09 [0.03 0.14]	0.03 [-0.03 0.09]

Note: The second differences reflect the difference between the AMEs of the subgroups in the first column of the table and the AMEs of the particular subset in the last three columns. The numbers in the brackets reflect 95% credible intervals.

3.4 How peer effects vary depending on personal morals

Figure 8: Predictions of average crime frequencies (peer associations x personal morals)



Note: The plot shows how the predictions of average crime frequencies vary along the dimension of differential peer associations, contingent on personal morals. The black dots and lines reflect point and 95% credible interval predictions. The focal peer association variable was categorized into eight evenly spaced subsets (-2 to -1.5, -1.5 to -1, …, 1.5 to 2) to predict the average crime frequencies with the observed-value approach. PM = Personal morals.

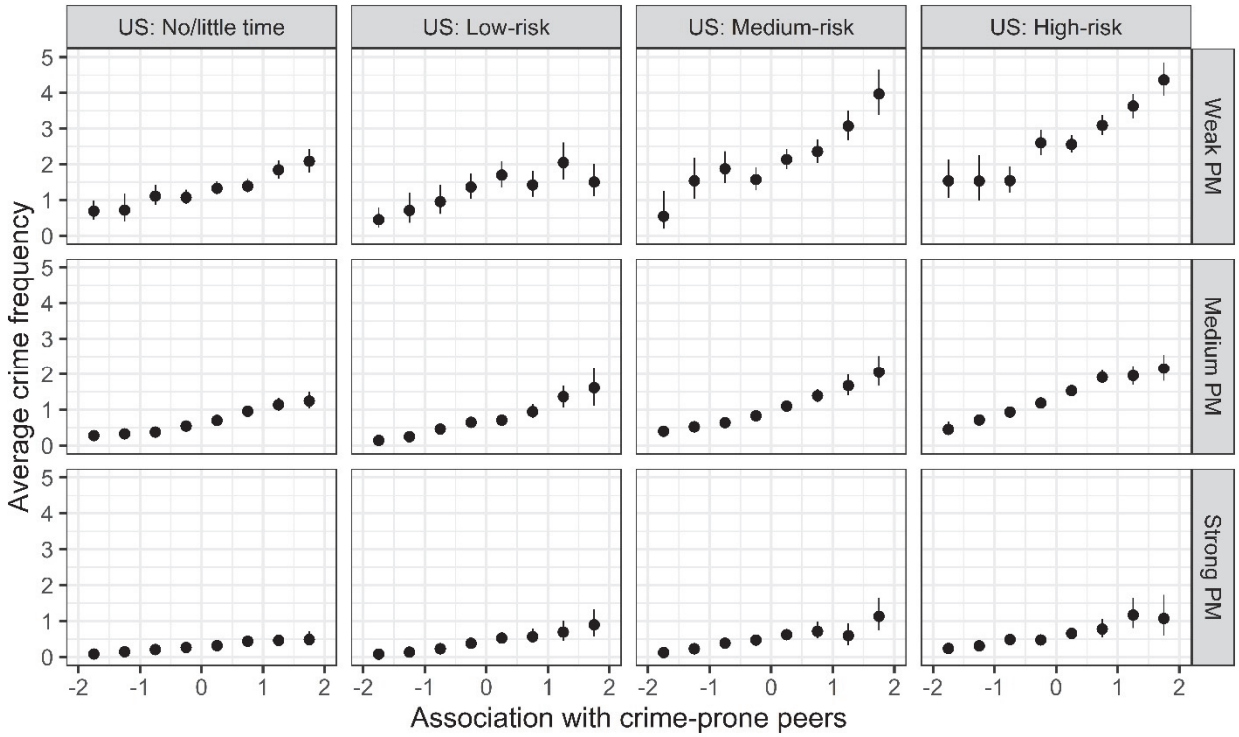
Table 13: Average marginal effects (of peer associations, contingent on personal morals)

Personal morals	**N**	**AME**	**Second differences**	
			Medium	**Strong**
Weak	1,126	0.22 [0.17 0.28]	0.08 [0.04 0.12]	0.16 [0.11 0.21]
Medium	3,699	0.14 [0.12 0.16]		0.08 [0.07 0.09]
Strong	5,223	0.06 [0.05 0.07]		

Note: The second differences reflect the difference between the AMEs of the subgroups in the first column of the table and the AMEs of the particular subset in the last three columns. The numbers in the brackets reflect 95% credible intervals.

3.5 How peer effects vary depending on unstructured socializing and personal morals

Figure 9: Predictions of average crime frequencies (peer associations x unstructured socializing x personal morals)



Note: The plot shows how the predictions of average crime frequencies vary along the dimension of differential peer associations, contingent on the combination of unstructured socializing and personal morals. The black dots and lines reflect point and 95% credible interval predictions. The focal peer association variable was categorized into eight evenly spaced subsets (-2 to -1.5, -1.5 to -1, ..., 1.5 to 2) to predict the average crime frequencies with the observed-value approach. US = Unstructured socializing. PM = Personal morals.

Table 14: Average marginal effects (of peer associations, contingent on unstructured socializing and personal morals)

Unstructured socializing	Personal morals	N	AME
No/little time	Weak	376	0.13 [0.07 0.20]
Low-risk	Weak	136	0.15 [0.06 0.25]
Medium-risk	Weak	211	0.32 [0.20 0.45]
High-risk	Weak	403	0.28 [0.17 0.39]
No/little time	Medium	1,371	0.09 [0.07 0.11]
Low-risk	Medium	543	0.13 [0.09 0.16]
Medium-risk	Medium	897	0.18 [0.13 0.22]
High-risk	Medium	888	0.19 [0.14 0.25]
No/little time	Strong	2,432	0.04 [0.03 0.06]
Low-risk	Strong	1,203	0.07 [0.05 0.09]
Medium-risk	Strong	918	0.08 [0.05 0.10]
High-risk	Strong	670	0.10 [0.06 0.13]

Note: The numbers in the brackets reflect 95% credible intervals.

Table 15: Second (AME) differences (of peer associations, contingent on unstructured socializing and personal morals)

Group 1		Group 2		Second Differences
Unstructured socializing	Personal morals	Unstructured socializing	Personal morals	(AME_{Group1} -AME_{Group2})
High-risk	Weak	Medium-risk	Weak	-0.04 [-0.21 0.12]
High-risk	Weak	High-risk	Medium	0.09 [0.00 0.17]
High-risk	Weak	Low-risk	Weak	0.13 [-0.02 0.27]
High-risk	Weak	Medium-risk	Medium	0.10 [-0.01 0.22]
High-risk	Weak	No/little time	Weak	0.15 [0.03 0.27]
High-risk	Weak	Low-risk	Medium	0.15 [0.04 0.26]
High-risk	Weak	High-risk	Strong	0.18 [0.08 0.29]
High-risk	Weak	No/little time	Medium	0.19 [0.08 0.30]
High-risk	Weak	Medium-risk	Strong	0.20 [0.09 0.31]
High-risk	Weak	Low-risk	Strong	0.21 [0.10 0.32]
High-risk	Weak	No/little time	Strong	0.24 [0.13 0.34]
Medium-risk	Weak	High-risk	Medium	0.12 [0.00 0.26]
Medium-risk	Weak	Low-risk	Weak	0.17 [0.02 0.31]
Medium-risk	Weak	Medium-risk	Medium	0.14 [0.05 0.24]
Medium-risk	Weak	No/little time	Weak	0.19 [0.06 0.33]
Medium-risk	Weak	Low-risk	Medium	0.19 [0.07 0.32]
Medium-risk	Weak	High-risk	Strong	0.22 [0.10 0.35]
Medium-risk	Weak	No/little time	Medium	0.23 [0.11 0.36]
Medium-risk	Weak	Medium-risk	Strong	0.24 [0.12 0.37]
Medium-risk	Weak	Low-risk	Strong	0.25 [0.13 0.38]
Medium-risk	Weak	No/little time	Strong	0.27 [0.16 0.40]
High-risk	Medium	Low-risk	Weak	0.04 [-0.07 0.14]
High-risk	Medium	Medium-risk	Medium	0.02 [-0.05 0.08]
High-risk	Medium	No/little time	Weak	0.06 [-0.02 0.15]
High-risk	Medium	Low-risk	Medium	0.07 [0.01 0.13]
High-risk	Medium	High-risk	Strong	0.10 [0.07 0.13]
High-risk	Medium	No/little time	Medium	0.10 [0.05 0.16]
High-risk	Medium	Medium-risk	Strong	0.12 [0.06 0.17]
High-risk	Medium	Low-risk	Strong	0.12 [0.07 0.18]
High-risk	Medium	No/little time	Strong	0.15 [0.10 0.20]
Low-risk	Weak	Medium-risk	Medium	-0.02 [-0.12 0.08]
Low-risk	Weak	No/little time	Weak	0.02 [-0.09 0.14]

Group 1		Group 2		Second Differences
Unstructured socializing	**Personal morals**	**Unstructured socializing**	**Personal morals**	**(AME_{Group1} -AME_{Group2})**
Low-risk	Weak	Low-risk	Medium	0.03 [-0.04 0.11]
Low-risk	Weak	High-risk	Strong	0.06 [-0.04 0.16]
Low-risk	Weak	No/little time	Medium	0.06 [-0.03 0.16]
Low-risk	Weak	Medium-risk	Strong	0.08 [-0.02 0.18]
Low-risk	Weak	Low-risk	Strong	0.08 [0.00 0.18]
Low-risk	Weak	No/little time	Strong	0.11 [0.02 0.21]
Medium-risk	Medium	No/little time	Weak	0.05 [-0.03 0.13]
Medium-risk	Medium	Low-risk	Medium	0.05 [-0.01 0.10]
Medium-risk	Medium	High-risk	Strong	0.08 [0.03 0.14]
Medium-risk	Medium	No/little time	Medium	0.08 [0.04 0.14]
Medium-risk	Medium	Medium-risk	Strong	0.10 [0.07 0.13]
Medium-risk	Medium	Low-risk	Strong	0.11 [0.06 0.16]
Medium-risk	Medium	No/little time	Strong	0.13 [0.09 0.18]
No/little time	Weak	Low-risk	Medium	0.00 [-0.07 0.08]
No/little time	Weak	High-risk	Strong	0.03 [-0.04 0.11]
No/little time	Weak	No/little time	Medium	0.04 [-0.01 0.09]
No/little time	Weak	Medium-risk	Strong	0.05 [-0.02 0.12]
No/little time	Weak	Low-risk	Strong	0.06 [-0.01 0.13]
No/little time	Weak	No/little time	Strong	0.08 [0.02 0.15]
Low-risk	Medium	High-risk	Strong	0.03 [-0.02 0.08]
Low-risk	Medium	No/little time	Medium	0.04 [-0.01 0.08]
Low-risk	Medium	Medium-risk	Strong	0.05 [0.01 0.09]
Low-risk	Medium	Low-risk	Strong	0.06 [0.03 0.08]
Low-risk	Medium	No/little time	Strong	0.08 [0.05 0.12]
High-risk	Strong	No/little time	Medium	0.00 [-0.03 0.04]
High-risk	Strong	Medium-risk	Strong	0.02 [-0.02 0.06]
High-risk	Strong	Low-risk	Strong	0.03 [-0.01 0.07]
High-risk	Strong	No/little time	Strong	0.05 [0.02 0.09]
No/little time	Medium	Medium-risk	Strong	0.01 [-0.02 0.05]
No/little time	Medium	Low-risk	Strong	0.02 [-0.01 0.05]
No/little time	Medium	No/little time	Strong	0.05 [0.03 0.06]
Medium-risk	Strong	Low-risk	Strong	0.01 [-0.02 0.04]
Medium-risk	Strong	No/little time	Strong	0.03 [0.01 0.06]
Low-risk	Strong	No/little time	Strong	0.03 [0.00 0.05]

Note: The groups are sorted by the size of their respective AME from the main article (see Table 4 in main article). The numbers in the brackets reflect 95% credible intervals.

4. Multilevel negative binomial model with log link

4.1 Model formula

$$
\begin{aligned}
\text{Delinquency}_i &\sim \text{NegBin}(\mu_i, \phi) && \text{[Likelihood]}\\
\log(\mu_i) &= \alpha_{ID[i]} + && \text{[Varying intercept]}\\
&\quad \beta_1\,\text{DiffPeers}_i + && \text{[Main effects]}\\
&\quad \beta_2\,\text{US\_Low-Risk}_i + \beta_3\,\text{US\_Medium-Risk}_i + \beta_4\,\text{US\_High-Risk}_i +\\
&\quad \beta_5\,\text{PMorals}_i +\\
&\quad \beta_6\,\text{Year\_2004}_i + \beta_7\,\text{Year\_2005}_i + \beta_8\,\text{Year\_2006}_i +\\
&\quad \beta_9\,\text{DiffPeers}_i * \text{US\_Low-Risk}_i + && \text{[Two-way interactions]}\\
&\quad \beta_{10}\,\text{DiffPeers}_i * \text{US\_Medium-Risk}_i + \beta_{11}\,\text{DiffPeers}_i * \text{US\_High-Risk}_i +\\
&\quad \beta_{12}\,\text{DiffPeers}_i * \text{PMorals}_i +\\
&\quad \beta_{13}\,\text{US\_Low-Risk}_i * \text{PMorals}_i + \beta_{14}\,\text{US\_Medium-Risk}_i * \text{PMorals}_i +\\
&\quad \beta_{15}\,\text{US\_High-Risk}_i * \text{PMorals}_i +\\
&\quad \beta_{16}\,\text{DiffPeers}_i * \text{US\_Low-Risk}_i * \text{PMorals}_i + && \text{[Three-way interactions]}\\
&\quad \beta_{17}\,\text{DiffPeers}_i * \text{US\_Medium-Risk}_i * \text{PMorals}_i +\\
&\quad \beta_{18}\,\text{DiffPeers}_i * \text{US\_High-Risk}_i * \text{PMorals}_i\\
\phi &\sim \text{Exponential}(1) && \text{[Prior for shape parameter phi]}\\
\alpha_{ID} &\sim \text{Normal}(\bar{\alpha}, \sigma) && \text{[Adaptive prior]}\\
\bar{\alpha} &\sim \text{Normal}(0, 2) && \text{[Prior for average person]}\\
\sigma &\sim \text{Normal}(0, 1) && \text{[Prior for standard deviation of persons]}\\
\beta_k &\sim \text{Normal}(0, 0.1) && \text{[Prior for all k = 1 … 18 beta coefficients]}
\end{aligned}
$$

Note: i = individual observation (ranges from i = 1 … 9,654); ID = ID of each person (ranges from i = 1 … 3,290); DiffPeers = Differential peer associations; US_Low-Risk = Unstructured socializing: Low-risk; US_Medium-Risk = Unstructured socializing: Medium-risk; US_High-Risk = Unstructured socializing: High-risk; PMorals = Personal morals; Year_2004 = Panel wave 2004; Year_2005 = Panel wave 2005; Year_2006 = Panel wave 2006.

4.2 The average peer effect

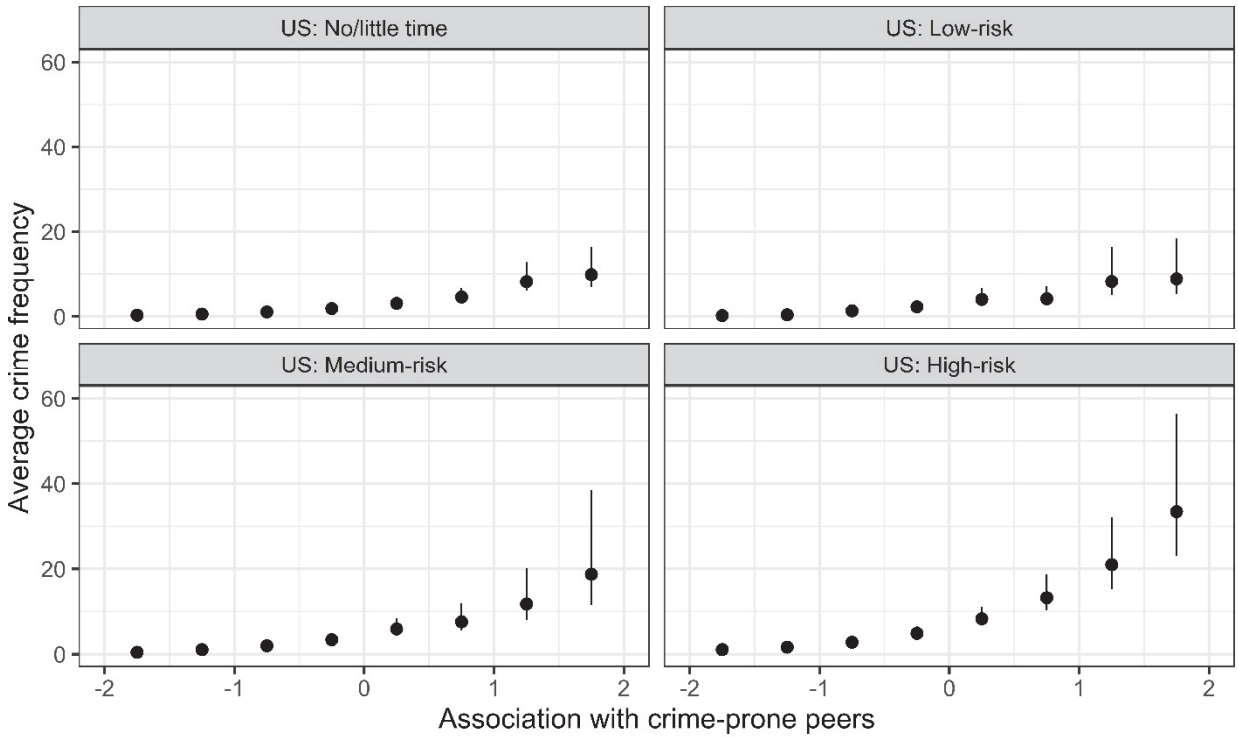
Table 16: Average marginal effects (main effects)

	AME
Differential peer associations	1.02 [0.79 1.29]
Unstructured socializing	
(ref. cat.: No/little time)	
Low-risk	-0.07 [-0.36 0.28]
Medium-risk	0.58 [0.25 0.99]
High-risk	1.56 [1.11 2.19]
Personal morals	-1.06 [-1.29 -0.88]
Panel wave	
(ref. cat.: 2003)	
2004	-0.03 [-0.44 0.38]
2005	-0.82 [-1.23 -0.46]
2006	-1.25 [-1.68 -0.89]
N (interviews)	9,654

Note: The numbers in the brackets reflect 95% credible intervals.

4.3 How peer effects vary depending on unstructured socializing

Figure 10: Predictions of average crime frequencies (peer associations x unstructured socializing)



Note: The plot shows how the predictions of average crime frequencies vary along the dimension of differential peer associations, contingent on unstructured socializing. The black dots and lines reflect point and 95% credible interval predictions. The focal peer association variable was categorized into eight evenly spaced subsets (-2 to -1.5, -1.5 to -1, ..., 1.5 to 2) to predict the average crime frequencies with the observed-value approach. US = Unstructured socializing.

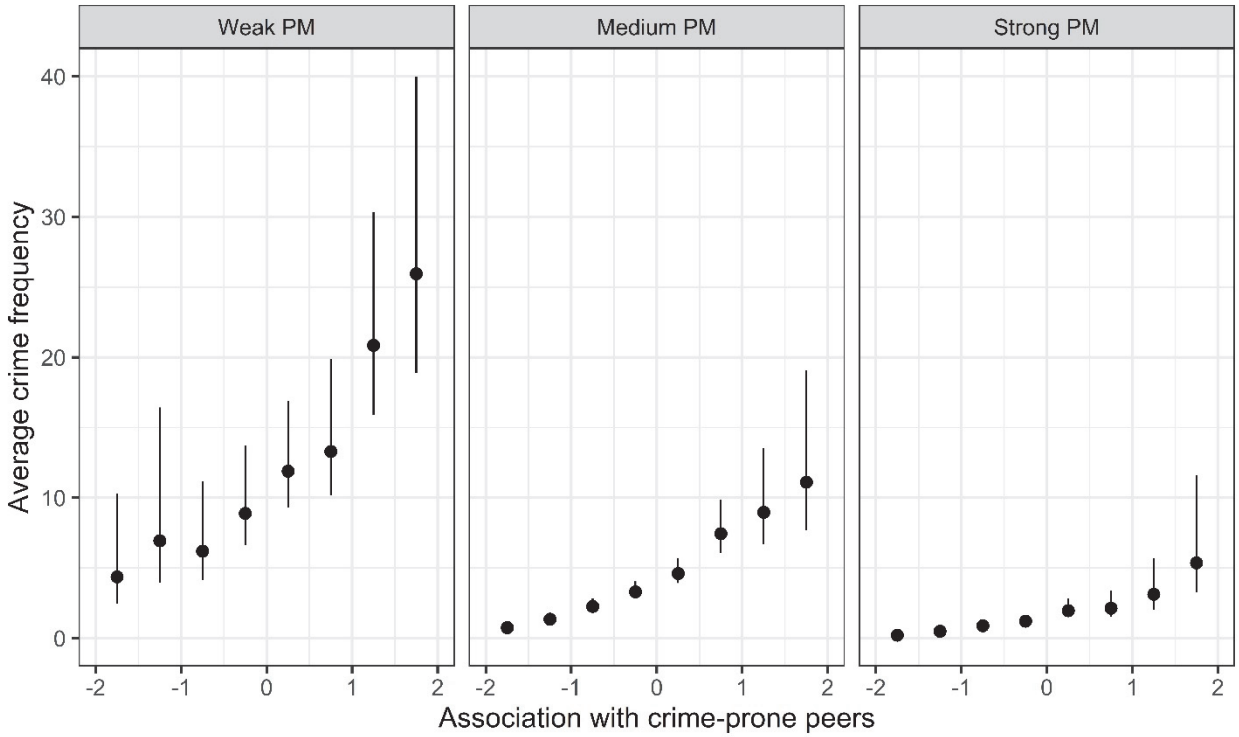
Table 17: Average marginal effects (of peer associations, contingent on unstructured socializing)

Unstructured socializing	**N**	**AME**	**Second differences**		
			No/little time	**Low-risk**	**Medium-risk**
No/little time	4,065	0.56 [0.43 0.74]			
Low-risk	1,833	0.64 [0.43 0.93]	0.08 [-0.15 0.35]		
Medium-risk	1,936	1.05 [0.71 1.52]	0.49 [0.15 0.92]	0.41 [-0.02 0.89]	
High-risk	1,820	2.32 [1.57 3.39]	1.75 [1.04 2.79]	1.68 [0.90 2.72]	1.26 [0.46 2.31]

Note: The second differences reflect the difference between the AMEs of the subgroups in the first column of the table and the AMEs of the particular subset in the last three columns. The numbers in the brackets reflect 95% credible intervals.

4.4 How peer effects vary depending on personal morals

Figure 11: Predictions of average crime frequencies (peer associations x personal morals)



Note: The plot shows how the predictions of average crime frequencies vary along the dimension of differential peer associations, contingent on personal morals. The black dots and lines reflect point and 95% credible interval predictions. The focal peer association variable was categorized into eight evenly spaced subsets (-2 to -1.5, -1.5 to -1, …, 1.5 to 2) to predict the average crime frequencies with the observed-value approach. PM = Personal morals.

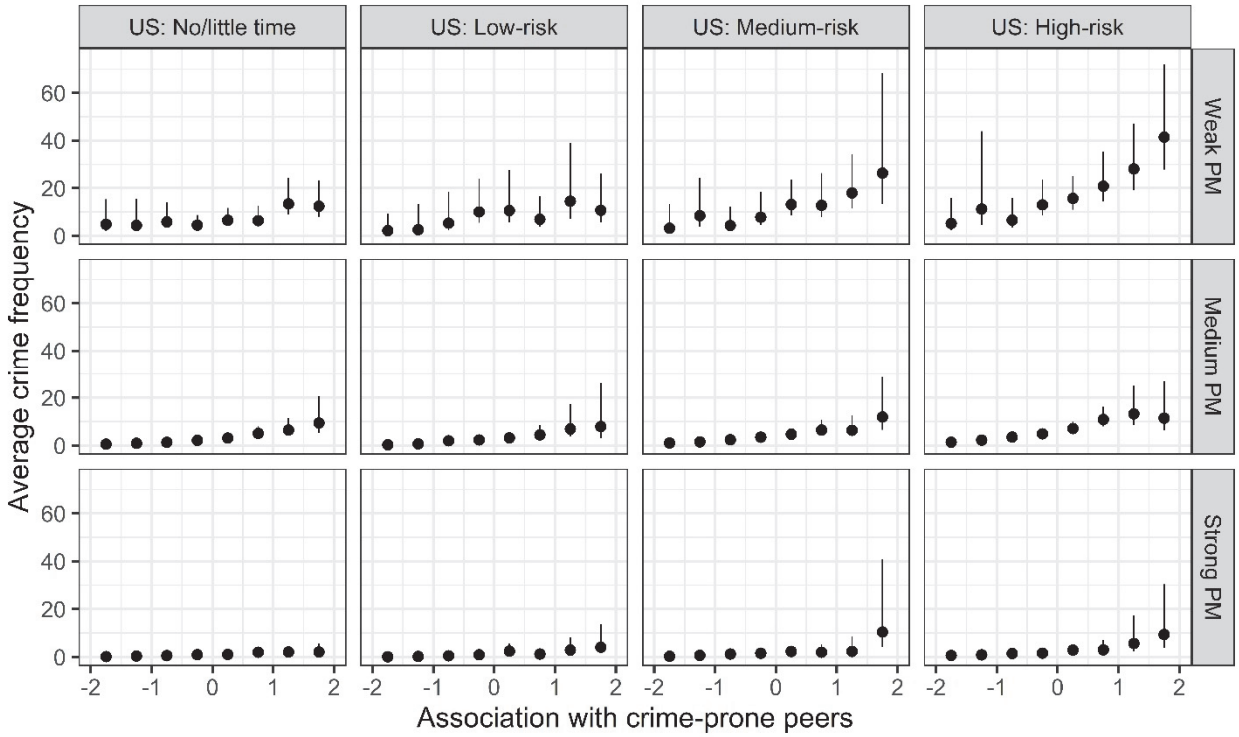
Table 18: Average marginal effects (of peer associations, contingent on personal morals)

Personal morals	N	AME	Second differences	
			Medium	Strong
Weak	973	3.09 [1.84 4.91]	1.74 [0.63 3.43]	2.70 [1.47 4.49]
Medium	3,529	1.34 [1.07 1.66]		0.94 [0.73 1.22]
Strong	5,152	0.39 [0.31 0.50]		

Note: The second differences reflect the difference between the AMEs of the subgroups in the first column of the table and the AMEs of the particular subset in the last three columns. The numbers in the brackets reflect 95% credible intervals.

4.5 How peer effects vary depending on unstructured socializing and personal morals

Figure 12: Predictions of average crime frequencies (peer associations x unstructured socializing x personal morals)



Note: The plot shows how the predictions of average crime frequencies vary along the dimension of differential peer associations, contingent on the combination of unstructured socializing and personal morals. The black dots and lines reflect point and 95% credible interval predictions. The focal peer association variable was categorized into eight evenly spaced subsets (-2 to -1.5, -1.5 to -1, ..., 1.5 to 2) to predict the average crime frequencies with the observed-value approach. US = Unstructured socializing. PM = Personal morals.

Table 19: Average marginal effects (of peer associations, contingent on unstructured socializing and personal morals)

Unstructured socializing	Personal morals	N	AME
No/little time	Weak	336	1.31 [0.65 2.30]
Low-risk	Weak	127	1.51 [0.36 3.45]
Medium-risk	Weak	176	2.94 [1.18 6.00]
High-risk	Weak	334	5.40 [2.71 9.87]
No/little time	Medium	1,327	0.88 [0.68 1.18]
Low-risk	Medium	521	1.07 [0.73 1.59]
Medium-risk	Medium	852	1.26 [0.87 1.79]
High-risk	Medium	829	2.28 [1.64 3.17]
No/little time	Strong	2,402	0.28 [0.22 0.36]
Low-risk	Strong	1,185	0.34 [0.23 0.55]
Medium-risk	Strong	908	0.46 [0.31 0.73]
High-risk	Strong	657	0.75 [0.52 1.14]

Note: The numbers in the brackets reflect 95% credible intervals.

Table 20: Second (AME) differences (of peer associations, contingent on unstructured socializing and personal morals).

Group 1		Group 2		Second Differences
Unstructured socializing	Personal morals	Unstructured socializing	Personal morals	(AME_{Group1} -AME_{Group2})
High-risk	Weak	Medium-risk	Weak	2.37 [-1.23 6.86]
High-risk	Weak	High-risk	Medium	3.10 [0.66 7.21]
High-risk	Weak	Low-risk	Weak	3.83 [0.70 8.31]
High-risk	Weak	Medium-risk	Medium	4.12 [1.45 8.57]
High-risk	Weak	No/little time	Weak	4.06 [1.45 8.28]
High-risk	Weak	Low-risk	Medium	4.32 [1.60 8.74]
High-risk	Weak	High-risk	Strong	4.62 [1.93 9.04]
High-risk	Weak	No/little time	Medium	4.51 [1.83 8.90]
High-risk	Weak	Medium-risk	Strong	4.92 [2.24 9.37]
High-risk	Weak	Low-risk	Strong	5.05 [2.33 9.49]
High-risk	Weak	No/little time	Strong	5.11 [2.43 9.56]
Medium-risk	Weak	High-risk	Medium	0.65 [-1.25 3.64]
Medium-risk	Weak	Low-risk	Weak	1.38 [-1.06 4.45]
Medium-risk	Weak	Medium-risk	Medium	1.67 [0.09 4.55]
Medium-risk	Weak	No/little time	Weak	1.59 [-0.10 4.47]
Medium-risk	Weak	Low-risk	Medium	1.85 [0.06 4.90]
Medium-risk	Weak	High-risk	Strong	2.18 [0.39 5.26]
Medium-risk	Weak	No/little time	Medium	2.05 [0.32 5.10]
Medium-risk	Weak	Medium-risk	Strong	2.46 [0.72 5.52]
Medium-risk	Weak	Low-risk	Strong	2.58 [0.83 5.66]
Medium-risk	Weak	No/little time	Strong	2.66 [0.90 5.72]
High-risk	Medium	Low-risk	Weak	0.77 [-1.16 2.13]
High-risk	Medium	Medium-risk	Medium	1.02 [0.26 1.91]
High-risk	Medium	No/little time	Weak	0.97 [-0.09 1.94]
High-risk	Medium	Low-risk	Medium	1.20 [0.44 2.12]
High-risk	Medium	High-risk	Strong	1.51 [1.00 2.24]
High-risk	Medium	No/little time	Medium	1.39 [0.77 2.24]
High-risk	Medium	Medium-risk	Strong	1.80 [1.16 2.68]
High-risk	Medium	Low-risk	Strong	1.92 [1.27 2.81]
High-risk	Medium	No/little time	Strong	2.00 [1.37 2.88]

Group 1		Group 2		Second Differences
Unstructured socializing	**Personal morals**	**Unstructured socializing**	**Personal morals**	**(AME_{Group1} - AME_{Group2})**
Low-risk	Weak	Medium-risk	Medium	0.25 [-0.98 2.15]
Low-risk	Weak	No/little time	Weak	0.20 [-1.06 2.00]
Low-risk	Weak	Low-risk	Medium	0.43 [-0.61 2.21]
Low-risk	Weak	High-risk	Strong	0.75 [-0.44 2.67]
Low-risk	Weak	No/little time	Medium	0.62 [-0.50 2.51]
Low-risk	Weak	Medium-risk	Strong	1.04 [-0.13 2.97]
Low-risk	Weak	Low-risk	Strong	1.16 [0.01 3.09]
Low-risk	Weak	No/little time	Strong	1.23 [0.08 3.17]
Medium-risk	Medium	No/little time	Weak	-0.05 [-1.01 0.68]
Medium-risk	Medium	Low-risk	Medium	0.19 [-0.43 0.77]
Medium-risk	Medium	High-risk	Strong	0.49 [0.00 1.05]
Medium-risk	Medium	No/little time	Medium	0.37 [-0.04 0.87]
Medium-risk	Medium	Medium-risk	Strong	0.78 [0.47 1.22]
Medium-risk	Medium	Low-risk	Strong	0.91 [0.49 1.43]
Medium-risk	Medium	No/little time	Strong	0.98 [0.60 1.49]
No/little time	Weak	Low-risk	Medium	0.23 [-0.54 1.18]
No/little time	Weak	High-risk	Strong	0.54 [-0.19 1.53]
No/little time	Weak	No/little time	Medium	0.42 [-0.17 1.31]
No/little time	Weak	Medium-risk	Strong	0.84 [0.15 1.83]
No/little time	Weak	Low-risk	Strong	0.96 [0.28 1.95]
No/little time	Weak	No/little time	Strong	1.03 [0.37 2.02]
Low-risk	Medium	High-risk	Strong	0.31 [-0.17 0.87]
Low-risk	Medium	No/little time	Medium	0.18 [-0.19 0.68]
Low-risk	Medium	Medium-risk	Strong	0.59 [0.19 1.13]
Low-risk	Medium	Low-risk	Strong	0.71 [0.42 1.18]
Low-risk	Medium	No/little time	Strong	0.78 [0.46 1.30]
High-risk	Strong	No/little time	Medium	-0.13 [-0.47 0.27]
High-risk	Strong	Medium-risk	Strong	0.28 [-0.03 0.67]
High-risk	Strong	Low-risk	Strong	0.40 [0.12 0.80]
High-risk	Strong	No/little time	Strong	0.47 [0.24 0.85]
No/little time	Medium	Medium-risk	Strong	0.41 [0.13 0.71]
No/little time	Medium	Low-risk	Strong	0.53 [0.28 0.82]
No/little time	Medium	No/little time	Strong	0.60 [0.43 0.86]
Medium-risk	Strong	Low-risk	Strong	0.12 [-0.12 0.39]
Medium-risk	Strong	No/little time	Strong	0.19 [0.03 0.45]
Low-risk	Strong	No/little time	Strong	0.06 [-0.05 0.26]

Note: The groups are sorted by the size of their respective AME from the main article (see Table 4 in main article). The numbers in the brackets reflect 95% credible intervals.

5. Multilevel Poisson model with inverse softplus link

5.1 Model formula

$$
\begin{aligned}
\text{Delinquency}_i &\sim \text{Poisson}(\lambda_i) && \text{[Likelihood]}\\
\text{invsoftplus}(\lambda_i) &= \alpha_{ID[i]} + && \text{[Varying intercept]}\\
&\quad \beta_1\,\text{DiffPeers}_i + && \text{[Main effects]}\\
&\quad \beta_2\,\text{US\_Low-Risk}_i + \beta_3\,\text{US\_Medium-Risk}_i + \beta_4\,\text{US\_High-Risk}_i +\\
&\quad \beta_5\,\text{PMorals}_i +\\
&\quad \beta_6\,\text{Year\_2004}_i + \beta_7\,\text{Year\_2005}_i + \beta_8\,\text{Year\_2006}_i +\\
&\quad \beta_9\,\text{DiffPeers}_i * \text{US\_Low-Risk}_i + && \text{[Two-way interactions]}\\
&\quad \beta_{10}\,\text{DiffPeers}_i * \text{US\_Medium-Risk}_i + \beta_{11}\,\text{DiffPeers}_i * \text{US\_High-Risk}_i +\\
&\quad \beta_{12}\,\text{DiffPeers}_i * \text{PMorals}_i +\\
&\quad \beta_{13}\,\text{US\_Low-Risk}_i * \text{PMorals}_i + \beta_{14}\,\text{US\_Medium-Risk}_i * \text{PMorals}_i +\\
&\quad \beta_{15}\,\text{US\_High-Risk}_i * \text{PMorals}_i +\\
&\quad \beta_{16}\,\text{DiffPeers}_i * \text{US\_Low-Risk}_i * \text{PMorals}_i + && \text{[Three-way interactions]}\\
&\quad \beta_{17}\,\text{DiffPeers}_i * \text{US\_Medium-Risk}_i * \text{PMorals}_i +\\
&\quad \beta_{18}\,\text{DiffPeers}_i * \text{US\_High-Risk}_i * \text{PMorals}_i\\
\alpha_{ID} &\sim \text{Normal}(\bar{\alpha}, \sigma) && \text{[Adaptive prior]}\\
\bar{\alpha} &\sim \text{Normal}(0, 10) && \text{[Prior for average person]}\\
\sigma &\sim \text{Normal}(0, 10) && \text{[Prior for standard deviation of persons]}\\
\beta_k &\sim \text{Normal}(0, 5) && \text{[Prior for all k = 1 … 18 beta coefficients]}
\end{aligned}
$$

Note: i = individual observation (ranges from i = 1 … 9,654); ID = ID of each person (ranges from i = 1 … 3,290); DiffPeers = Differential peer associations; US_Low-Risk = Unstructured socializing: Low-risk; US_Medium-Risk = Unstructured socializing: Medium-risk; US_High-Risk = Unstructured socializing: High-risk; PMorals = Personal morals; Year_2004 = Panel wave 2004; Year_2005 = Panel wave 2005; Year_2006 = Panel wave 2006.

5.2 The average peer effect

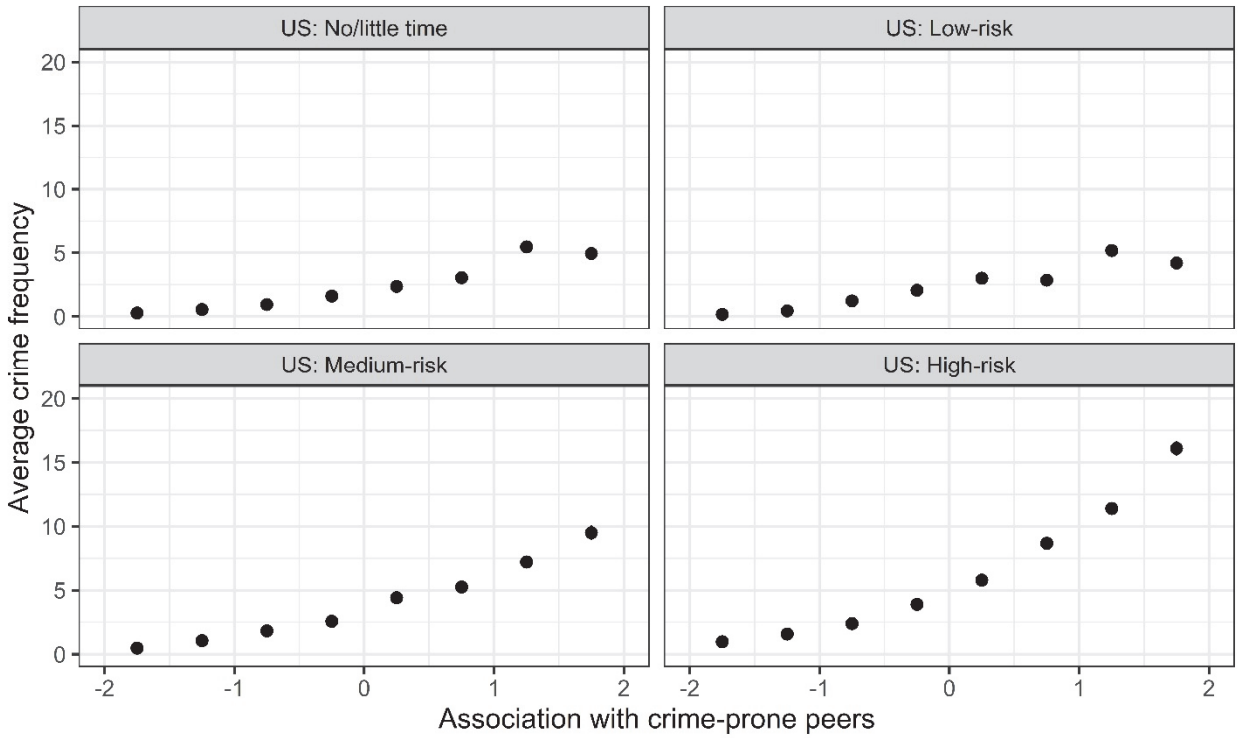
Table 21: Average marginal effects (main effects)

	AME
Differential peer associations	0.28 [0.25 0.30]
Unstructured socializing (ref. cat.: No/little time)	
Low-risk	-0.11 [-0.19 -0.03]
Medium-risk	0.24 [0.17 0.32]
High-risk	0.64 [0.55 0.73]
Personal morals	-0.53 [-0.56 -0.50]
Panel wave (ref. cat.: 2003)	
2004	-0.32 [-0.40 -0.24]
2005	-0.72 [-0.80 -0.65]
2006	-0.95 [-1.02 -0.88]
N (interviews)	9,654

Note: The numbers in the brackets reflect 95% credible intervals.

5.3 How peer effects vary depending on unstructured socializing

Figure 13: Predictions of average crime frequencies (peer associations x unstructured socializing)



Note: The plot shows how the predictions of average crime frequencies vary along the dimension of differential peer associations, contingent on unstructured socializing. The black dots and lines reflect point and 95% credible interval predictions. The focal peer association variable was categorized into eight evenly spaced subsets (-2 to -1.5, -1.5 to -1, ..., 1.5 to 2) to predict the average crime frequencies with the observed-value approach. US = Unstructured socializing.

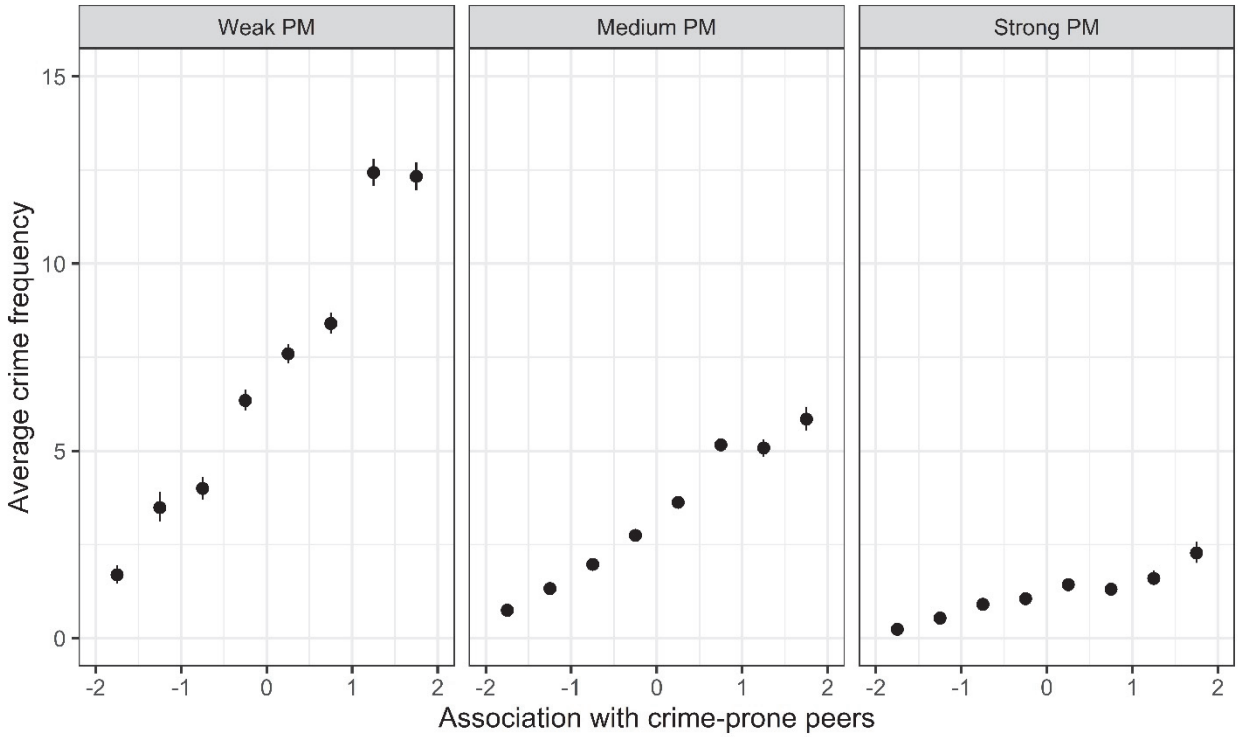
Table 22: Average marginal effects (of peer associations, contingent on unstructured socializing)

Unstructured socializing	**N**	**AME**	**Second differences**		
			No/little time	**Low-risk**	**Medium-risk**
No/little time	4,065	0.15 [0.12 0.18]			
Low-risk	1,833	0.20 [0.17 0.25]	0.06 [0.01 0.10]		
Medium-risk	1,936	0.28 [0.22 0.34]	0.13 [0.07 0.20]	0.07 [0.01 0.14]	
High-risk	1,820	0.64 [0.56 0.72]	0.50 [0.41 0.58]	0.44 [0.35 0.53]	0.36 [0.27 0.46]

Note: The second differences reflect the difference between the AMEs of the subgroups in the first column of the table and the AMEs of the particular subset in the last three columns. The numbers in the brackets reflect 95% credible intervals.

5.4 How peer effects vary depending on personal morals

Figure 14: Predictions of average crime frequencies (peer associations x personal morals)



Note: The plot shows how the predictions of average crime frequencies vary along the dimension of differential peer associations, contingent on personal morals. The black dots and lines reflect point and 95% credible interval predictions. The focal peer association variable was categorized into eight evenly spaced subsets (-2 to -1.5, -1.5 to -1, …, 1.5 to 2) to predict the average crime frequencies with the observed-value approach. PM = Personal morals.

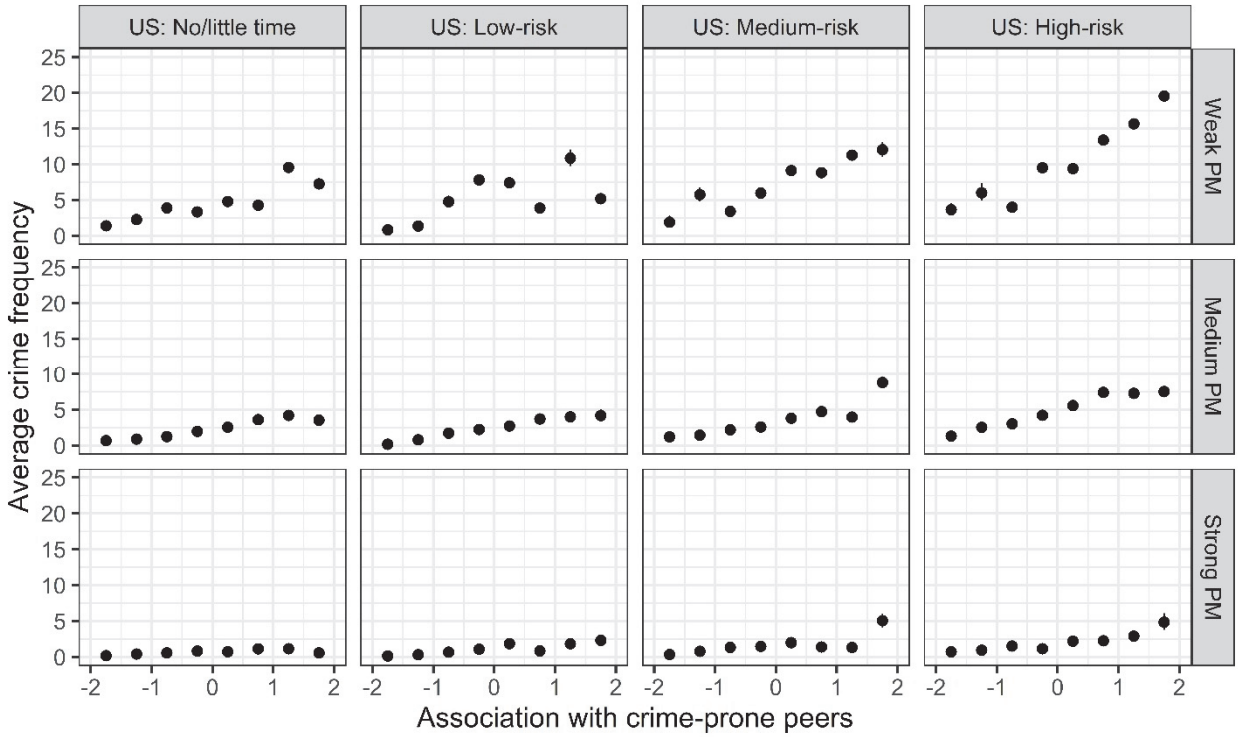
Table 23: Average marginal effects (of peer associations, contingent on personal morals)

Personal morals	N	AME	Second differences	
			Medium	Strong
Weak	973	0.76 [0.67 0.85]	0.39 [0.32 0.46]	0.64 [0.55 0.73]
Medium	3,529	0.37 [0.34 0.41]		0.25 [0.22 0.28]
Strong	5,152	0.12 [0.10 0.14]		

Note: The second differences reflect the difference between the AMEs of the subgroups in the first column of the table and the AMEs of the particular subset in the last three columns. The numbers in the brackets reflect 95% credible intervals.

5.5 How peer effects vary depending on unstructured socializing and personal morals

Figure 15: Predictions of average crime frequencies (peer associations x unstructured socializing x personal morals)



Note: The plot shows how the predictions of average crime frequencies vary along the dimension of differential peer associations, contingent on the combination of unstructured socializing and personal morals. The black dots and lines reflect point and 95% credible interval predictions. The focal peer association variable was categorized into eight evenly spaced subsets (-2 to -1.5, -1.5 to -1, ..., 1.5 to 2) to predict the average crime frequencies with the observed-value approach. US = Unstructured socializing. PM = Personal morals.

Table 24: Average marginal effects (of peer associations, contingent on unstructured socializing and personal morals)

Unstructured socializing	Personal morals	N	AME
No/little time	Weak	336	0.50 [0.39 0.63]
Low-risk	Weak	127	0.27 [0.12 0.44]
Medium-risk	Weak	176	0.62 [0.44 0.81]
High-risk	Weak	334	1.28 [1.11 1.45]
No/little time	Medium	1,327	0.22 [0.17 0.26]
Low-risk	Medium	521	0.29 [0.23 0.35]
Medium-risk	Medium	852	0.35 [0.28 0.42]
High-risk	Medium	829	0.70 [0.61 0.79]
No/little time	Strong	2,402	0.06 [0.04 0.08]
Low-risk	Strong	1,185	0.16 [0.13 0.19]
Medium-risk	Strong	908	0.15 [0.11 0.19]
High-risk	Strong	657	0.25 [0.19 0.30]

Note: The numbers in the brackets reflect 95% credible intervals.

Table 25: Second (AME) differences (of peer associations, contingent on unstructured socializing and personal morals)

Group 1		Group 2		Second Differences
Unstructured socializing	Personal morals	Unstructured socializing	Personal morals	(AME_{Group1} -AME_{Group2})
High-risk	Weak	Medium-risk	Weak	0.66 [0.41 0.90]
High-risk	Weak	High-risk	Medium	0.58 [0.45 0.71]
High-risk	Weak	Low-risk	Weak	1.01 [0.77 1.24]
High-risk	Weak	Medium-risk	Medium	0.94 [0.75 1.12]
High-risk	Weak	No/little time	Weak	0.78 [0.57 0.98]
High-risk	Weak	Low-risk	Medium	0.99 [0.80 1.17]
High-risk	Weak	High-risk	Strong	1.04 [0.86 1.21]
High-risk	Weak	No/little time	Medium	1.07 [0.88 1.24]
High-risk	Weak	Medium-risk	Strong	1.14 [0.95 1.31]
High-risk	Weak	Low-risk	Strong	1.12 [0.94 1.30]
High-risk	Weak	No/little time	Strong	1.23 [1.04 1.40]
Medium-risk	Weak	High-risk	Medium	-0.08 [-0.28 0.13]
Medium-risk	Weak	Low-risk	Weak	0.35 [0.11 0.59]
Medium-risk	Weak	Medium-risk	Medium	0.27 [0.13 0.42]
Medium-risk	Weak	No/little time	Weak	0.12 [-0.09 0.34]
Medium-risk	Weak	Low-risk	Medium	0.33 [0.14 0.52]
Medium-risk	Weak	High-risk	Strong	0.38 [0.18 0.57]
Medium-risk	Weak	No/little time	Medium	0.41 [0.21 0.59]
Medium-risk	Weak	Medium-risk	Strong	0.48 [0.29 0.67]
Medium-risk	Weak	Low-risk	Strong	0.46 [0.28 0.65]
Medium-risk	Weak	No/little time	Strong	0.57 [0.38 0.75]
High-risk	Medium	Low-risk	Weak	0.43 [0.24 0.61]
High-risk	Medium	Medium-risk	Medium	0.35 [0.24 0.46]
High-risk	Medium	No/little time	Weak	0.20 [0.05 0.34]
High-risk	Medium	Low-risk	Medium	0.41 [0.30 0.51]
High-risk	Medium	High-risk	Strong	0.45 [0.39 0.51]
High-risk	Medium	No/little time	Medium	0.48 [0.39 0.58]
High-risk	Medium	Medium-risk	Strong	0.55 [0.46 0.65]
High-risk	Medium	Low-risk	Strong	0.54 [0.45 0.64]
High-risk	Medium	No/little time	Strong	0.64 [0.55 0.73]
Low-risk	Weak	Medium-risk	Medium	-0.08 [-0.25 0.10]
Low-risk	Weak	No/little time	Weak	-0.23 [-0.42 -0.03]

Group 1		Group 2		Second Differences
Unstructured socializing	**Personal morals**	**Unstructured socializing**	**Personal morals**	**(AME_{Group1} -AME_{Group2})**
Low-risk	Weak	Low-risk	Medium	-0.02 [-0.14 0.11]
Low-risk	Weak	High-risk	Strong	0.03 [-0.14 0.20]
Low-risk	Weak	No/little time	Medium	0.06 [-0.10 0.22]
Low-risk	Weak	Medium-risk	Strong	0.12 [-0.04 0.30]
Low-risk	Weak	Low-risk	Strong	0.11 [-0.04 0.28]
Low-risk	Weak	No/little time	Strong	0.21 [0.06 0.38]
Medium-risk	Medium	No/little time	Weak	-0.15 [-0.29 -0.02]
Medium-risk	Medium	Low-risk	Medium	0.06 [-0.03 0.15]
Medium-risk	Medium	High-risk	Strong	0.10 [0.02 0.19]
Medium-risk	Medium	No/little time	Medium	0.13 [0.05 0.21]
Medium-risk	Medium	Medium-risk	Strong	0.20 [0.15 0.25]
Medium-risk	Medium	Low-risk	Strong	0.19 [0.11 0.27]
Medium-risk	Medium	No/little time	Strong	0.29 [0.22 0.36]
No/little time	Weak	Low-risk	Medium	0.21 [0.08 0.34]
No/little time	Weak	High-risk	Strong	0.25 [0.13 0.39]
No/little time	Weak	No/little time	Medium	0.28 [0.20 0.38]
No/little time	Weak	Medium-risk	Strong	0.35 [0.23 0.48]
No/little time	Weak	Low-risk	Strong	0.34 [0.22 0.47]
No/little time	Weak	No/little time	Strong	0.44 [0.33 0.57]
Low-risk	Medium	High-risk	Strong	0.05 [-0.04 0.13]
Low-risk	Medium	No/little time	Medium	0.07 [0.00 0.15]
Low-risk	Medium	Medium-risk	Strong	0.14 [0.07 0.22]
Low-risk	Medium	Low-risk	Strong	0.13 [0.09 0.18]
Low-risk	Medium	No/little time	Strong	0.23 [0.17 0.30]
High-risk	Strong	No/little time	Medium	0.03 [-0.04 0.10]
High-risk	Strong	Medium-risk	Strong	0.10 [0.03 0.17]
High-risk	Strong	Low-risk	Strong	0.09 [0.03 0.15]
High-risk	Strong	No/little time	Strong	0.19 [0.13 0.25]
No/little time	Medium	Medium-risk	Strong	0.07 [0.01 0.13]
No/little time	Medium	Low-risk	Strong	0.06 [0.01 0.11]
No/little time	Medium	No/little time	Strong	0.16 [0.13 0.19]
Medium-risk	Strong	Low-risk	Strong	-0.01 [-0.06 0.04]
Medium-risk	Strong	No/little time	Strong	0.09 [0.05 0.14]
Low-risk	Strong	No/little time	Strong	0.10 [0.07 0.14]

Note: The groups are sorted by the size of their respective AME from the main article (see Table 4 in main article). The numbers in the brackets reflect 95% credible intervals.

6. Multilevel Poisson model with log link

6.1 Model formula

$$
\begin{aligned}
\text{Delinquency}_i &\sim \text{Poisson}(\lambda_i) && \text{[Likelihood]}\\
\log(\lambda_i) &= \alpha_{ID[i]} + && \text{[Varying intercept]}\\
&\quad \beta_1\,\text{DiffPeers}_i + && \text{[Main effects]}\\
&\quad \beta_2\,\text{US\_Low-Risk}_i + \beta_3\,\text{US\_Medium-Risk}_i + \beta_4\,\text{US\_High-Risk}_i +\\
&\quad \beta_5\,\text{PMorals}_i +\\
&\quad \beta_6\,\text{Year\_2004}_i + \beta_7\,\text{Year\_2005}_i + \beta_8\,\text{Year\_2006}_i +\\
&\quad \beta_9\,\text{DiffPeers}_i * \text{US\_Low-Risk}_i + && \text{[Two-way interactions]}\\
&\quad \beta_{10}\,\text{DiffPeers}_i * \text{US\_Medium-Risk}_i + \beta_{11}\,\text{DiffPeers}_i * \text{US\_High-Risk}_i +\\
&\quad \beta_{12}\,\text{DiffPeers}_i * \text{PMorals}_i +\\
&\quad \beta_{13}\,\text{US\_Low-Risk}_i * \text{PMorals}_i + \beta_{14}\,\text{US\_Medium-Risk}_i * \text{PMorals}_i +\\
&\quad \beta_{15}\,\text{US\_High-Risk}_i * \text{PMorals}_i +\\
&\quad \beta_{16}\,\text{DiffPeers}_i * \text{US\_Low-Risk}_i * \text{PMorals}_i + && \text{[Three-way interactions]}\\
&\quad \beta_{17}\,\text{DiffPeers}_i * \text{US\_Medium-Risk}_i * \text{PMorals}_i +\\
&\quad \beta_{18}\,\text{DiffPeers}_i * \text{US\_High-Risk}_i * \text{PMorals}_i\\
\alpha_{ID} &\sim \text{Normal}(\bar{\alpha}, \sigma) && \text{[Adaptive prior]}\\
\bar{\alpha} &\sim \text{Normal}(0, 2) && \text{[Prior for average person]}\\
\sigma &\sim \text{Normal}(0, 1) && \text{[Prior for standard deviation of persons]}\\
\beta_k &\sim \text{Normal}(0, 0.4) && \text{[Prior for all k = 1 … 18 beta coefficients]}
\end{aligned}
$$

Note: i = individual observation (ranges from i = 1 … 9,654); ID = ID of each person (ranges from i = 1 … 3,290); DiffPeers = Differential peer associations; US_Low-Risk = Unstructured socializing: Low-risk; US_Medium-Risk = Unstructured socializing: Medium-risk; US_High-Risk = Unstructured socializing: High-risk; PMorals = Personal morals; Year_2004 = Panel wave 2004; Year_2005 = Panel wave 2005; Year_2006 = Panel wave 2006.

6.2 The average peer effect

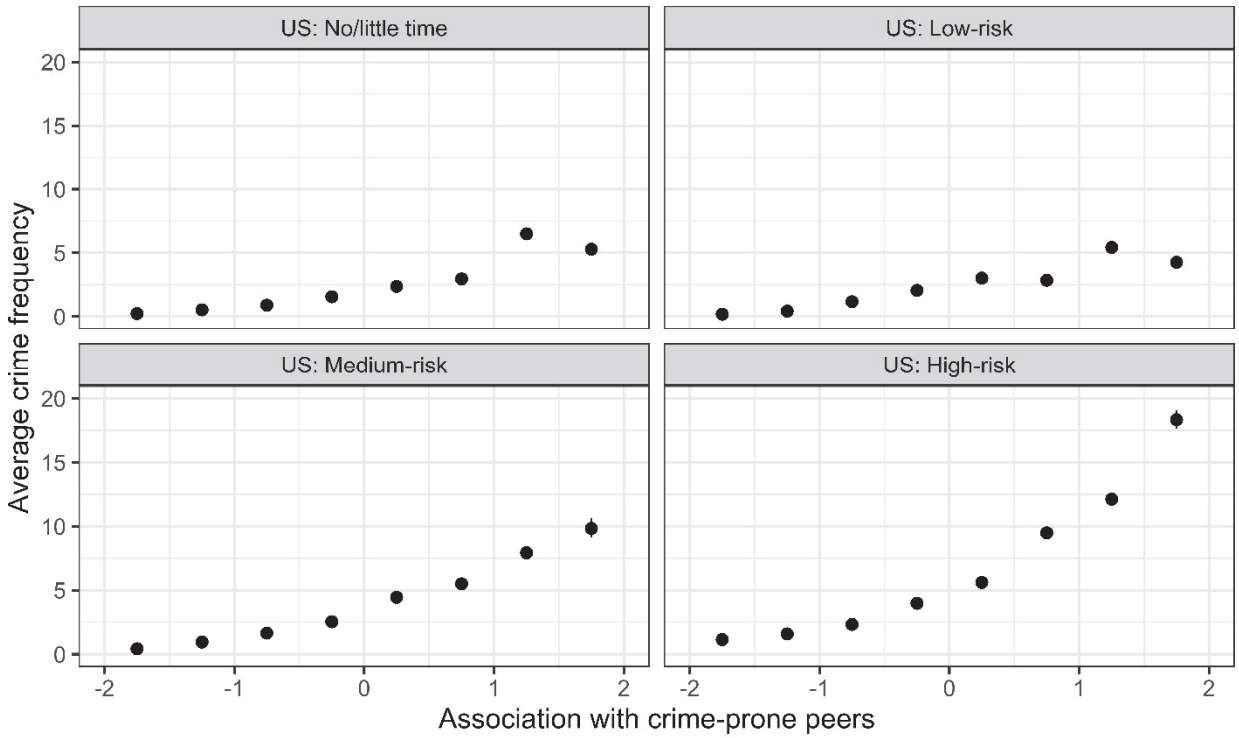
Table 26: Average marginal effects (main effects)

	AME
Differential peer associations	0.36 [0.33 0.40]
Unstructured socializing (ref. cat.: No/little time)	
Low-risk	-0.14 [-0.23 -0.04]
Medium-risk	0.09 [0.01 0.17]
High-risk	0.57 [0.48 0.68]
Personal morals	-0.65 [-0.69 -0.62]
Panel wave (ref. cat.: 2003)	
2004	-0.38 [-0.48 -0.28]
2005	-0.79 [-0.88 -0.69]
2006	-1.16 [-1.25 -1.07]
N (interviews)	9,654

Note: The numbers in the brackets reflect 95% credible intervals.

6.3 How peer effects vary depending on unstructured socializing

Figure 16: Predictions of average crime frequencies (peer associations x unstructured socializing)



Note: The plot shows how the predictions of average crime frequencies vary along the dimension of differential peer associations, contingent on unstructured socializing. The black dots and lines reflect point and 95% credible interval predictions. The focal peer association variable was categorized into eight evenly spaced subsets (-2 to -1.5, -1.5 to -1, ..., 1.5 to 2) to predict the average crime frequencies with the observed-value approach. US = Unstructured socializing.

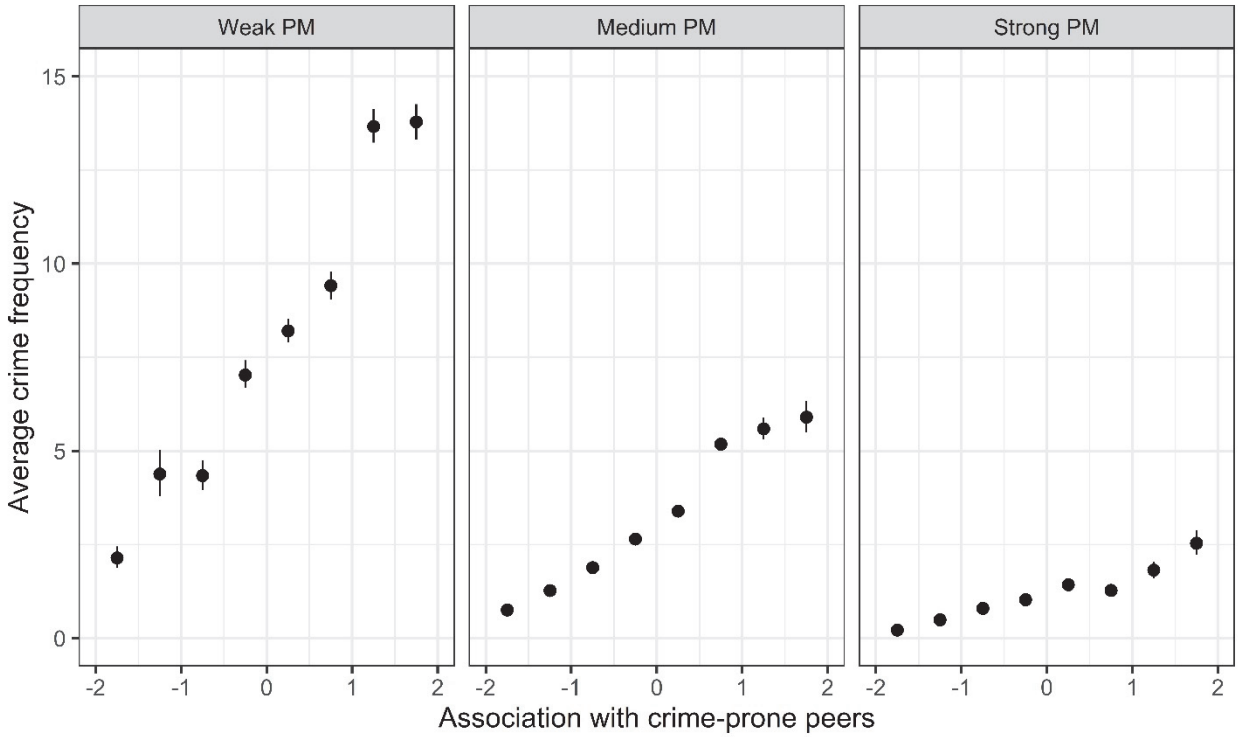
Table 27: Average marginal effects (of peer associations, contingent on unstructured socializing)

Unstructured socializing	**N**	**AME**	**Second differences**		
			No/little time	**Low-risk**	**Medium-risk**
No/little time	4,065	0.20 [0.16 0.24]			
Low-risk	1,833	0.27 [0.22 0.33]	0.07 [0.01 0.13]		
Medium-risk	1,936	0.36 [0.29 0.44]	0.16 [0.08 0.24]	0.09 [0.00 0.18]	
High-risk	1,820	0.83 [0.70 0.96]	0.63 [0.50 0.76]	0.56 [0.42 0.69]	0.47 [0.33 0.61]

Note: The second differences reflect the difference between the AMEs of the subgroups in the first column of the table and the AMEs of the particular subset in the last three columns. The numbers in the brackets reflect 95% credible intervals.

6.4 How peer effects vary depending on personal morals

Figure 17: Predictions of average crime frequencies (peer associations x personal morals)



Note: The plot shows how the predictions of average crime frequencies vary along the dimension of differential peer associations, contingent on personal morals. The black dots and lines reflect point and 95% credible interval predictions. The focal peer association variable was categorized into eight evenly spaced subsets (-2 to -1.5, -1.5 to -1, …, 1.5 to 2) to predict the average crime frequencies with the observed-value approach. PM = Personal morals.

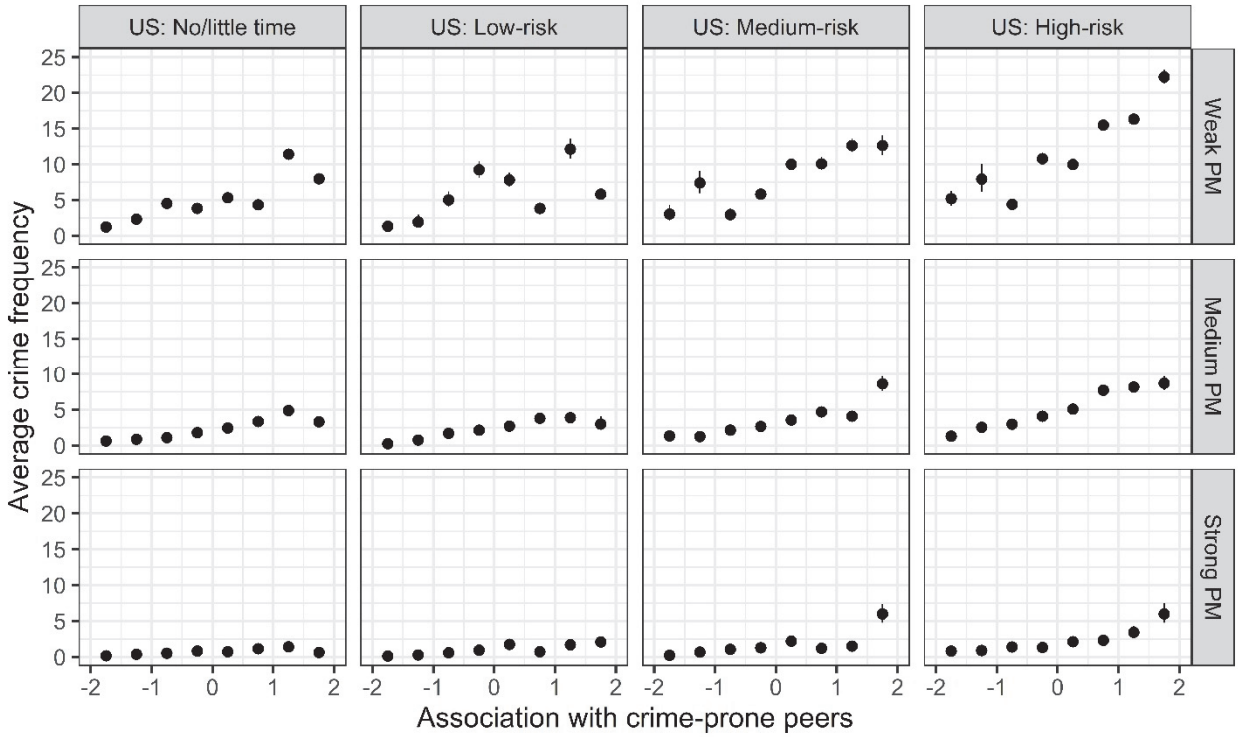
Table 28: Average marginal effects (of peer associations, contingent on personal morals)

Personal morals	N	AME	Second differences	
			Medium	Strong
Weak	973	0.70 [0.53 0.88]	0.17 [0.02 0.32]	0.51 [0.34 0.69]
Medium	3,529	0.53 [0.48 0.58]		0.34 [0.31 0.38]
Strong	5,152	0.19 [0.17 0.20]		

Note: The second differences reflect the difference between the AMEs of the subgroups in the first column of the table and the AMEs of the particular subset in the last three columns. The numbers in the brackets reflect 95% credible intervals.

6.5 How peer effects vary depending on unstructured socializing and personal morals

Figure 18: Predictions of average crime frequencies (peer associations x unstructured socializing x personal morals)



Note: The plot shows how the predictions of average crime frequencies vary along the dimension of differential peer associations, contingent on the combination of unstructured socializing and personal morals. The black dots and lines reflect point and 95% credible interval predictions. The focal peer association variable was categorized into eight evenly spaced subsets (-2 to -1.5, -1.5 to -1, ..., 1.5 to 2) to predict the average crime frequencies with the observed-value approach. US = Unstructured socializing. PM = Personal morals.

Table 29: Average marginal effects (of peer associations, contingent on unstructured socializing and personal morals)

Unstructured socializing	Personal morals	N	AME
No/little time	Weak	336	0.34 [0.13 0.55]
Low-risk	Weak	127	0.38 [0.11 0.66]
Medium-risk	Weak	176	0.55 [0.22 0.89]
High-risk	Weak	334	1.27 [0.90 1.66]
No/little time	Medium	1,327	0.31 [0.26 0.37]
Low-risk	Medium	521	0.45 [0.37 0.54]
Medium-risk	Medium	852	0.47 [0.39 0.56]
High-risk	Medium	829	0.98 [0.85 1.10]
No/little time	Strong	2,402	0.12 [0.10 0.14]
Low-risk	Strong	1,185	0.18 [0.15 0.21]
Medium-risk	Strong	908	0.22 [0.18 0.26]
High-risk	Strong	657	0.41 [0.36 0.47]

Note: The numbers in the brackets reflect 95% credible intervals.

Table 30: Second (AME) differences (of peer associations, contingent on unstructured socializing and personal morals)

Group 1		Group 2		Second Differences (AME_{Group1} -AME_{Group2})
Unstructured socializing	Personal morals	Unstructured socializing	Personal morals	
High-risk	Weak	Medium-risk	Weak	0.71 [0.23 1.22]
High-risk	Weak	High-risk	Medium	0.29 [-0.02 0.62]
High-risk	Weak	Low-risk	Weak	0.88 [0.43 1.36]
High-risk	Weak	Medium-risk	Medium	0.79 [0.42 1.18]
High-risk	Weak	No/little time	Weak	0.93 [0.52 1.36]
High-risk	Weak	Low-risk	Medium	0.81 [0.43 1.21]
High-risk	Weak	High-risk	Strong	0.85 [0.49 1.23]
High-risk	Weak	No/little time	Medium	0.95 [0.59 1.34]
High-risk	Weak	Medium-risk	Strong	1.05 [0.68 1.44]
High-risk	Weak	Low-risk	Strong	1.09 [0.72 1.48]
High-risk	Weak	No/little time	Strong	1.15 [0.78 1.54]
Medium-risk	Weak	High-risk	Medium	-0.43 [-0.77 -0.07]
Medium-risk	Weak	Low-risk	Weak	0.18 [-0.24 0.58]
Medium-risk	Weak	Medium-risk	Medium	0.08 [-0.20 0.37]
Medium-risk	Weak	No/little time	Weak	0.22 [-0.16 0.60]
Medium-risk	Weak	Low-risk	Medium	0.10 [-0.23 0.44]
Medium-risk	Weak	High-risk	Strong	0.14 [-0.19 0.48]
Medium-risk	Weak	No/little time	Medium	0.24 [-0.09 0.58]
Medium-risk	Weak	Medium-risk	Strong	0.33 [0.01 0.67]
Medium-risk	Weak	Low-risk	Strong	0.37 [0.05 0.72]
Medium-risk	Weak	No/little time	Strong	0.43 [0.11 0.78]
High-risk	Medium	Low-risk	Weak	0.60 [0.29 0.89]
High-risk	Medium	Medium-risk	Medium	0.50 [0.36 0.65]
High-risk	Medium	No/little time	Weak	0.64 [0.40 0.88]
High-risk	Medium	Low-risk	Medium	0.52 [0.37 0.67]
High-risk	Medium	High-risk	Strong	0.56 [0.48 0.65]
High-risk	Medium	No/little time	Medium	0.66 [0.53 0.80]
High-risk	Medium	Medium-risk	Strong	0.76 [0.63 0.88]
High-risk	Medium	Low-risk	Strong	0.80 [0.67 0.93]
High-risk	Medium	No/little time	Strong	0.86 [0.74 0.98]
Low-risk	Weak	Medium-risk	Medium	-0.10 [-0.37 0.19]
Low-risk	Weak	No/little time	Weak	0.04 [-0.29 0.38]

Group 1		Group 2		Second Differences (AME_{Group1} -AME_{Group2})
Unstructured socializing	**Personal morals**	**Unstructured socializing**	**Personal morals**	
Low-risk	Weak	Low-risk	Medium	-0.08 [-0.30 0.16]
Low-risk	Weak	High-risk	Strong	-0.04 [-0.31 0.25]
Low-risk	Weak	No/little time	Medium	0.06 [-0.20 0.35]
Low-risk	Weak	Medium-risk	Strong	0.16 [-0.11 0.44]
Low-risk	Weak	Low-risk	Strong	0.20 [-0.06 0.48]
Low-risk	Weak	No/little time	Strong	0.26 [0.00 0.55]
Medium-risk	Medium	No/little time	Weak	0.14 [-0.09 0.35]
Medium-risk	Medium	Low-risk	Medium	0.02 [-0.10 0.13]
Medium-risk	Medium	High-risk	Strong	0.06 [-0.04 0.16]
Medium-risk	Medium	No/little time	Medium	0.16 [0.06 0.26]
Medium-risk	Medium	Medium-risk	Strong	0.25 [0.19 0.31]
Medium-risk	Medium	Low-risk	Strong	0.29 [0.20 0.39]
Medium-risk	Medium	No/little time	Strong	0.35 [0.27 0.44]
No/little time	Weak	Low-risk	Medium	-0.12 [-0.34 0.11]
No/little time	Weak	High-risk	Strong	-0.08 [-0.29 0.14]
No/little time	Weak	No/little time	Medium	0.02 [-0.15 0.21]
No/little time	Weak	Medium-risk	Strong	0.12 [-0.09 0.33]
No/little time	Weak	Low-risk	Strong	0.16 [-0.05 0.38]
No/little time	Weak	No/little time	Strong	0.22 [0.02 0.43]
Low-risk	Medium	High-risk	Strong	0.04 [-0.06 0.14]
Low-risk	Medium	No/little time	Medium	0.14 [0.04 0.24]
Low-risk	Medium	Medium-risk	Strong	0.23 [0.14 0.33]
Low-risk	Medium	Low-risk	Strong	0.28 [0.21 0.34]
Low-risk	Medium	No/little time	Strong	0.34 [0.25 0.42]
High-risk	Strong	No/little time	Medium	0.10 [0.03 0.17]
High-risk	Strong	Medium-risk	Strong	0.19 [0.13 0.26]
High-risk	Strong	Low-risk	Strong	0.24 [0.18 0.30]
High-risk	Strong	No/little time	Strong	0.30 [0.24 0.35]
No/little time	Medium	Medium-risk	Strong	0.09 [0.03 0.16]
No/little time	Medium	Low-risk	Strong	0.14 [0.08 0.20]
No/little time	Medium	No/little time	Strong	0.20 [0.16 0.24]
Medium-risk	Strong	Low-risk	Strong	0.04 [0.00 0.09]
Medium-risk	Strong	No/little time	Strong	0.10 [0.06 0.14]
Low-risk	Strong	No/little time	Strong	0.06 [0.03 0.09]

Note: The groups are sorted by the size of their respective AME from the main article (see Table 4 in main article). The numbers in the brackets reflect 95% credible intervals.

7. Multilevel OLS model (with identity link)

7.1 Model formula

$$
\begin{aligned}
\text{Delinquency}_i &\sim \text{Normal}(\lambda_i, \sigma) && \text{[Likelihood]}\\
\text{identity}(\lambda_i) &= \alpha_{ID[i]} + && \text{[Varying intercept]}\\
&\quad \beta_1\,\text{DiffPeers}_i + && \text{[Main effects]}\\
&\quad \beta_2\,\text{US\_Low-Risk}_i + \beta_3\,\text{US\_Medium-Risk}_i + \beta_4\,\text{US\_High-Risk}_i +\\
&\quad \beta_5\,\text{PMorals}_i +\\
&\quad \beta_6\,\text{Year\_2004}_i + \beta_7\,\text{Year\_2005}_i + \beta_8\,\text{Year\_2006}_i +\\
&\quad \beta_9\,\text{DiffPeers}_i * \text{US\_Low-Risk}_i + && \text{[Two-way interactions]}\\
&\quad \beta_{10}\,\text{DiffPeers}_i * \text{US\_Medium-Risk}_i + \beta_{11}\,\text{DiffPeers}_i * \text{US\_High-Risk}_i +\\
&\quad \beta_{12}\,\text{DiffPeers}_i * \text{PMorals}_i +\\
&\quad \beta_{13}\,\text{US\_Low-Risk}_i * \text{PMorals}_i + \beta_{14}\,\text{US\_Medium-Risk}_i * \text{PMorals}_i +\\
&\quad \beta_{15}\,\text{US\_High-Risk}_i * \text{PMorals}_i +\\
&\quad \beta_{16}\,\text{DiffPeers}_i * \text{US\_Low-Risk}_i * \text{PMorals}_i + && \text{[Three-way interactions]}\\
&\quad \beta_{17}\,\text{DiffPeers}_i * \text{US\_Medium-Risk}_i * \text{PMorals}_i +\\
&\quad \beta_{18}\,\text{DiffPeers}_i * \text{US\_High-Risk}_i * \text{PMorals}_i\\
\sigma &\sim \text{Student\_t}(3, 0, 2.5) && \text{[Prior for sigma]}\\
\alpha_{ID} &\sim \text{Normal}(\bar{\alpha}, \sigma_\alpha) && \text{[Adaptive prior]}\\
\bar{\alpha} &\sim \text{Normal}(0, 10) && \text{[Prior for average person]}\\
\sigma_\alpha &\sim \text{Normal}(0, 10) && \text{[Prior for standard deviation of persons]}\\
\beta_k &\sim \text{Normal}(0, 5) && \text{[Prior for all k = 1 … 18 beta coefficients]}
\end{aligned}
$$

Note: i = individual observation (ranges from i = 1 … 9,654); ID = ID of each person (ranges from i = 1 … 3,290); DiffPeers = Differential peer associations; US_Low-Risk = Unstructured socializing: Low-risk; US_Medium-Risk = Unstructured socializing: Medium-risk; US_High-Risk = Unstructured socializing: High-risk; PMorals = Personal morals; Year_2004 = Panel wave 2004; Year_2005 = Panel wave 2005; Year_2006 = Panel wave 2006.

7.2 The average peer effect

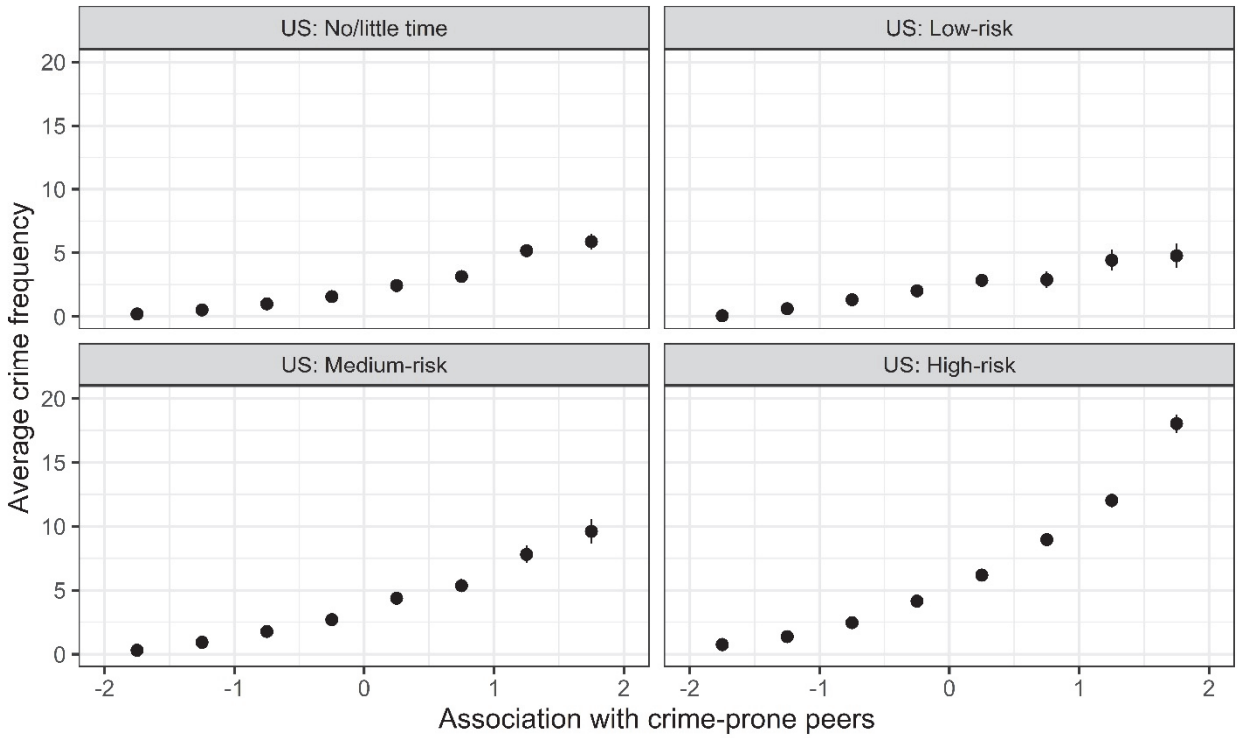
Table 31: Average marginal effects (main effects)

	AME
Differential peer associations	0.43 [0.34 0.50]
Unstructured socializing	
(ref. cat.: No/little time)	
Low-risk	-0.06 [-0.39 0.26]
Medium-risk	0.63 [0.30 0.96]
High-risk	1.34 [0.97 1.71]
Personal morals	-0.94 [-1.05 -0.83]
Panel wave	
(ref. cat.: 2003)	
2004	-0.25 [-0.54 0.04]
2005	-0.72 [-1.02 -0.42]
2006	-1.03 [-1.34 -0.73]
N (interviews)	9,654

Note: The numbers in the brackets reflect 95% credible intervals.

7.3 How peer effects vary depending on unstructured socializing

Figure 19: Predictions of average crime frequencies (peer associations x unstructured socializing)



Note: The plot shows how the predictions of average crime frequencies vary along the dimension of differential peer associations, contingent on unstructured socializing. The black dots and lines reflect point and 95% credible interval predictions. The focal peer association variable was categorized into eight evenly spaced subsets (-2 to -1.5, -1.5 to -1, ..., 1.5 to 2) to predict the average crime frequencies with the observed-value approach. US = Unstructured socializing.

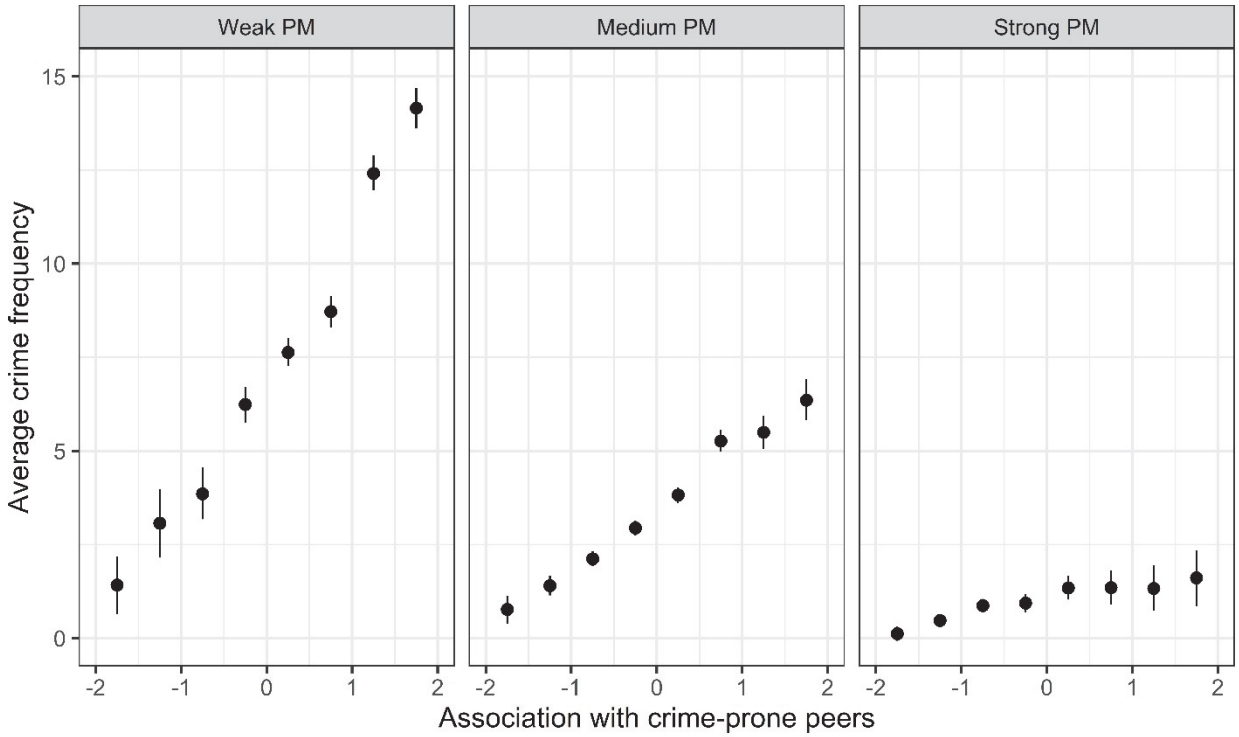
Table 32: Average marginal effects (of peer associations, contingent on unstructured socializing)

Unstructured socializing	**N**	**AME**	**Second differences**		
			No/little time	**Low-risk**	**Medium-risk**
No/little time	4,065	0.28 [0.16 0.39]			
Low-risk	1,833	0.31 [0.14 0.48]	0.03 [-0.16 0.23]		
Medium-risk	1,936	0.44 [0.26 0.61]	0.16 [-0.03 0.37]	0.13 [-0.10 0.37]	
High-risk	1,820	0.86 [0.69 1.04]	0.59 [0.38 0.79]	0.56 [0.31 0.80]	0.42 [0.19 0.66]

Note: The second differences reflect the difference between the AMEs of the subgroups in the first column of the table and the AMEs of the particular subset in the last three columns. The numbers in the brackets reflect 95% credible intervals.

7.4 How peer effects vary depending on personal morals

Figure 20: Predictions of average crime frequencies (peer associations x personal morals)



Note: The plot shows how the predictions of average crime frequencies vary along the dimension of differential peer associations, contingent on personal morals. The black dots and lines reflect point and 95% credible interval predictions. The focal peer association variable was categorized into eight evenly spaced subsets (-2 to -1.5, -1.5 to -1, ..., 1.5 to 2) to predict the average crime frequencies with the observed-value approach. PM = Personal morals.

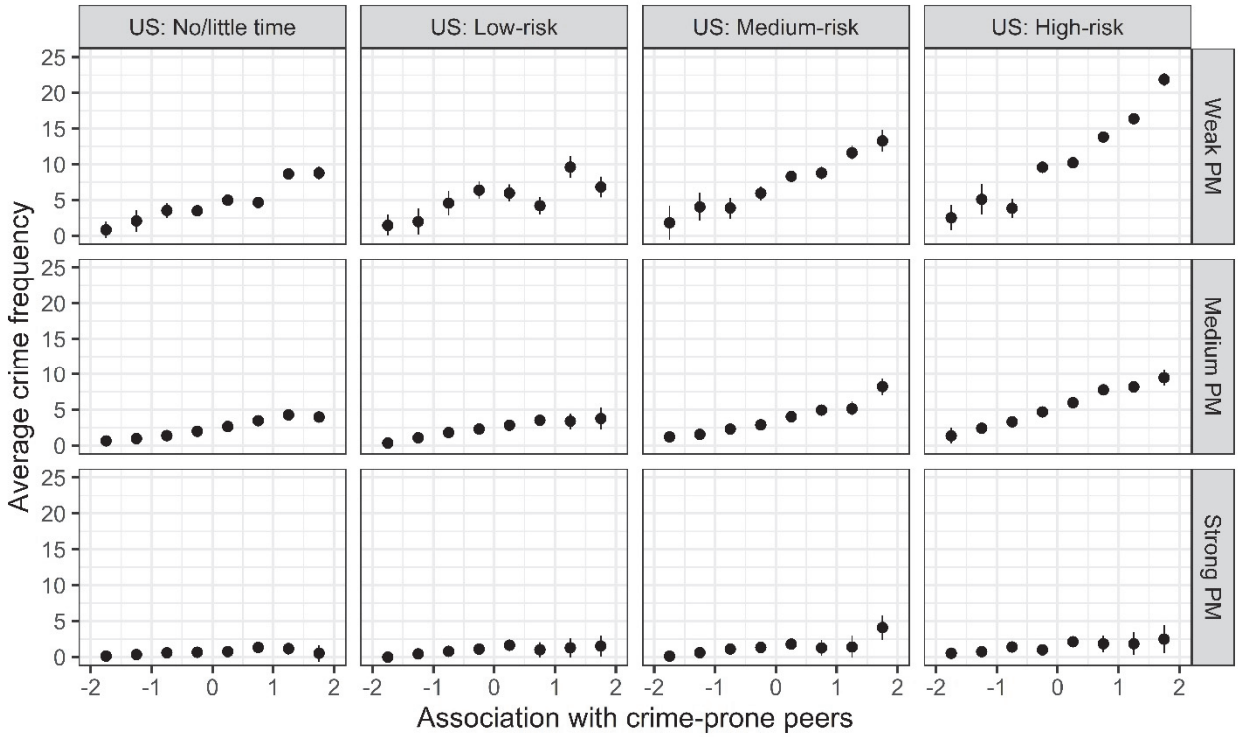
Table 33: Average marginal effects (of peer associations, contingent on personal morals)

Personal morals	**N**	**AME**	**Second differences**	
			Medium	**Strong**
Weak	973	1.23 [1.11 1.35]	0.64 [0.56 0.72]	1.06 [0.92 1.21]
Medium	3,529	0.59 [0.50 0.67]		0.42 [0.35 0.49]
Strong	5,152	0.16 [0.07 0.26]		

Note: The second differences reflect the difference between the AMEs of the subgroups in the first column of the table and the AMEs of the particular subset in the last three columns. The numbers in the brackets reflect 95% credible intervals.

7.5 How peer effects vary depending on unstructured socializing and personal morals

Figure 21: Predictions of average crime frequencies (peer associations x unstructured socializing x personal morals)



Note: The plot shows how the predictions of average crime frequencies vary along the dimension of differential peer associations, contingent on the combination of unstructured socializing and personal morals. The black dots and lines reflect point and 95% credible interval predictions. The focal peer association variable was categorized into eight evenly spaced subsets (-2 to -1.5, -1.5 to -1, ..., 1.5 to 2) to predict the average crime frequencies with the observed-value approach. US = Unstructured socializing. PM = Personal morals.

Table 34: Average marginal effects (of peer associations, contingent on unstructured socializing and personal morals)

Unstructured socializing	Personal morals	N	AME
No/little time	Weak	336	0.83 [0.65 1.01]
Low-risk	Weak	127	0.56 [0.30 0.82]
Medium-risk	Weak	176	1.04 [0.77 1.33]
High-risk	Weak	334	1.97 [1.73 2.22]
No/little time	Medium	1,327	0.43 [0.32 0.55]
Low-risk	Medium	521	0.38 [0.22 0.55]
Medium-risk	Medium	852	0.57 [0.40 0.76]
High-risk	Medium	829	0.97 [0.80 1.15]
No/little time	Strong	2,402	0.11 [-0.02 0.24]
Low-risk	Strong	1,185	0.25 [0.06 0.44]
Medium-risk	Strong	908	0.19 [-0.01 0.40]
High-risk	Strong	657	0.16 [-0.05 0.37]

Note: The numbers in the brackets reflect 95% credible intervals.

Table 35: Second (AME) differences (of peer associations, contingent on unstructured socializing and personal morals)

Group 1		**Group 2**		**Second Differences**
Unstructured socializing	**Personal morals**	**Unstructured socializing**	**Personal morals**	**(AME_{Group1} -AME_{Group2})**
High-risk	Weak	Medium-risk	Weak	0.92 [0.57 1.29]
High-risk	Weak	High-risk	Medium	1.00 [0.84 1.16]
High-risk	Weak	Low-risk	Weak	1.41 [1.06 1.76]
High-risk	Weak	Medium-risk	Medium	1.40 [1.12 1.69]
High-risk	Weak	No/little time	Weak	1.14 [0.84 1.45]
High-risk	Weak	Low-risk	Medium	1.59 [1.28 1.88]
High-risk	Weak	High-risk	Strong	1.81 [1.53 2.10]
High-risk	Weak	No/little time	Medium	1.54 [1.28 1.82]
High-risk	Weak	Medium-risk	Strong	1.78 [1.46 2.09]
High-risk	Weak	Low-risk	Strong	1.72 [1.40 2.03]
High-risk	Weak	No/little time	Strong	1.86 [1.58 2.13]
Medium-risk	Weak	High-risk	Medium	0.07 [-0.25 0.39]
Medium-risk	Weak	Low-risk	Weak	0.48 [0.11 0.84]
Medium-risk	Weak	Medium-risk	Medium	0.47 [0.29 0.65]
Medium-risk	Weak	No/little time	Weak	0.21 [-0.11 0.53]
Medium-risk	Weak	Low-risk	Medium	0.66 [0.34 0.98]
Medium-risk	Weak	High-risk	Strong	0.88 [0.54 1.24]
Medium-risk	Weak	No/little time	Medium	0.61 [0.32 0.92]
Medium-risk	Weak	Medium-risk	Strong	0.85 [0.53 1.18]
Medium-risk	Weak	Low-risk	Strong	0.80 [0.45 1.14]
Medium-risk	Weak	No/little time	Strong	0.93 [0.63 1.24]
High-risk	Medium	Low-risk	Weak	0.41 [0.10 0.72]
High-risk	Medium	Medium-risk	Medium	0.40 [0.16 0.64]
High-risk	Medium	No/little time	Weak	0.14 [-0.11 0.39]
High-risk	Medium	Low-risk	Medium	0.59 [0.35 0.83]
High-risk	Medium	High-risk	Strong	0.82 [0.69 0.95]
High-risk	Medium	No/little time	Medium	0.55 [0.34 0.75]
High-risk	Medium	Medium-risk	Strong	0.78 [0.51 1.05]
High-risk	Medium	Low-risk	Strong	0.73 [0.47 0.99]
High-risk	Medium	No/little time	Strong	0.87 [0.65 1.08]
Low-risk	Weak	Medium-risk	Medium	-0.01 [-0.32 0.30]
Low-risk	Weak	No/little time	Weak	-0.27 [-0.58 0.04]
Low-risk	Weak	Low-risk	Medium	0.18 [0.00 0.35]
Low-risk	Weak	High-risk	Strong	0.41 [0.07 0.74]
Low-risk	Weak	No/little time	Medium	0.13 [-0.15 0.41]
Low-risk	Weak	Medium-risk	Strong	0.37 [0.04 0.71]
Low-risk	Weak	Low-risk	Strong	0.32 [0.00 0.62]
Low-risk	Weak	No/little time	Strong	0.45 [0.16 0.75]
Medium-risk	Medium	No/little time	Weak	-0.26 [-0.51 -0.01]
Medium-risk	Medium	Low-risk	Medium	0.19 [-0.05 0.43]
Medium-risk	Medium	High-risk	Strong	0.42 [0.15 0.69]
Medium-risk	Medium	No/little time	Medium	0.14 [-0.06 0.35]
Medium-risk	Medium	Medium-risk	Strong	0.38 [0.24 0.53]
Medium-risk	Medium	Low-risk	Strong	0.33 [0.07 0.58]
Medium-risk	Medium	No/little time	Strong	0.46 [0.25 0.68]
No/little time	Weak	Low-risk	Medium	0.45 [0.21 0.69]
No/little time	Weak	High-risk	Strong	0.68 [0.40 0.95]
No/little time	Weak	No/little time	Medium	0.40 [0.29 0.52]
No/little time	Weak	Medium-risk	Strong	0.64 [0.37 0.91]
No/little time	Weak	Low-risk	Strong	0.59 [0.33 0.85]
No/little time	Weak	No/little time	Strong	0.72 [0.52 0.93]
Low-risk	Medium	High-risk	Strong	0.23 [-0.04 0.49]

Group 1		Group 2		Second Differences
Unstructured socializing	**Personal morals**	**Unstructured socializing**	**Personal morals**	**(AME_{Group1} -AME_{Group2})**
Low-risk	Medium	No/little time	Medium	-0.04 [-0.24 0.15]
Low-risk	Medium	Medium-risk	Strong	0.19 [-0.07 0.46]
Low-risk	Medium	Low-risk	Strong	0.14 [0.00 0.27]
Low-risk	Medium	No/little time	Strong	0.27 [0.07 0.48]
High-risk	Strong	No/little time	Medium	-0.27 [-0.51 -0.03]
High-risk	Strong	Medium-risk	Strong	-0.04 [-0.32 0.25]
High-risk	Strong	Low-risk	Strong	-0.09 [-0.37 0.20]
High-risk	Strong	No/little time	Strong	0.05 [-0.20 0.29]
No/little time	Medium	Medium-risk	Strong	0.24 [0.01 0.47]
No/little time	Medium	Low-risk	Strong	0.18 [-0.03 0.40]
No/little time	Medium	No/little time	Strong	0.32 [0.23 0.41]
Medium-risk	Strong	Low-risk	Strong	-0.05 [-0.33 0.22]
Medium-risk	Strong	No/little time	Strong	0.08 [-0.15 0.32]
Low-risk	Strong	No/little time	Strong	0.14 [-0.09 0.35]

Note: The groups are sorted by the size of their respective AME from the main article (see Table 4 in main article). The numbers in the brackets reflect 95% credible intervals.

8. Multilevel negative binomial model with inverse softplus link (+ self-control)

8.1 Model formula

$$
\begin{aligned}
\text{Delinquency}_i &\sim \text{NegBin}(\mu_i, \phi) && \text{[Likelihood]}\\
\text{invsoftplus}(\mu_i) &= \alpha_{ID[i]} + && \text{[Varying intercept]}\\
&\quad \beta_1\,\text{DiffPeers}_i + && \text{[Main effects]}\\
&\quad \beta_2\,\text{US\_Low-Risk}_i + \beta_3\,\text{US\_Medium-Risk}_i + \beta_4\,\text{US\_High-Risk}_i +\\
&\quad \beta_5\,\text{PMorals}_i + \beta_6\,\text{LowSC}_i +\\
&\quad \beta_7\,\text{Year\_2004}_i + \beta_8\,\text{Year\_2005}_i + \beta_9\,\text{Year\_2006}_i +\\
&\quad \beta_{10}\,\text{DiffPeers}_i * \text{US\_Low-Risk}_i + && \text{[Two-way interactions]}\\
&\quad \beta_{11}\,\text{DiffPeers}_i * \text{US\_Medium-Risk}_i + \beta_{12}\,\text{DiffPeers}_i * \text{US\_High-Risk}_i +\\
&\quad \beta_{13}\,\text{DiffPeers}_i * \text{PMorals}_i +\\
&\quad \beta_{14}\,\text{US\_Low-Risk}_i * \text{PMorals}_i + \beta_{15}\,\text{US\_Medium-Risk}_i * \text{PMorals}_i +\\
&\quad \beta_{16}\,\text{US\_High-Risk}_i * \text{PMorals}_i +\\
&\quad \beta_{17}\,\text{DiffPeers}_i * \text{LowSC}_i + \beta_{18}\,\text{PMorals}_i * \text{LowSC}_i +\\
&\quad \beta_{19}\,\text{US\_Low-Risk}_i * \text{LowSC}_i + \beta_{20}\,\text{US\_Medium-Risk}_i * \text{LowSC}_i +\\
&\quad \beta_{21}\,\text{US\_High-Risk}_i * \text{LowSC}_i +\\
&\quad \beta_{22}\,\text{DiffPeers}_i * \text{US\_Low-Risk}_i * \text{PMorals}_i + && \text{[Three-way interactions]}\\
&\quad \beta_{23}\,\text{DiffPeers}_i * \text{US\_Medium-Risk}_i * \text{PMorals}_i +\\
&\quad \beta_{24}\,\text{DiffPeers}_i * \text{US\_High-Risk}_i * \text{PMorals}_i\\
\phi &\sim \text{Exponential}(1) && \text{[Prior for shape parameter phi]}\\
\alpha_{ID} &\sim \text{Normal}(\bar{\alpha}, \sigma) && \text{[Adaptive prior]}\\
\bar{\alpha} &\sim \text{Normal}(0, 10) && \text{[Prior for average person]}\\
\sigma &\sim \text{Normal}(0, 10) && \text{[Prior for standard deviation of persons]}\\
\beta_k &\sim \text{Normal}(0, 5) && \text{[Prior for all k = 1 … 24 beta coefficients]}
\end{aligned}
$$

Note: i = individual observation (ranges from i = 1 … 9,654); ID = ID of each person (ranges from i = 1 … 3,290); DiffPeers = Differential peer associations; US_Low-Risk = Unstructured socializing: Low-risk; US_Medium-Risk = Unstructured socializing: Medium-risk; US_High-Risk = Unstructured socializing: High-risk; PMorals = Personal morals; LowSC = Low self-control abilities; Year_2004 = Panel wave 2004; Year_2005 = Panel wave 2005; Year_2006 = Panel wave 2006.

8.2 The average peer effect

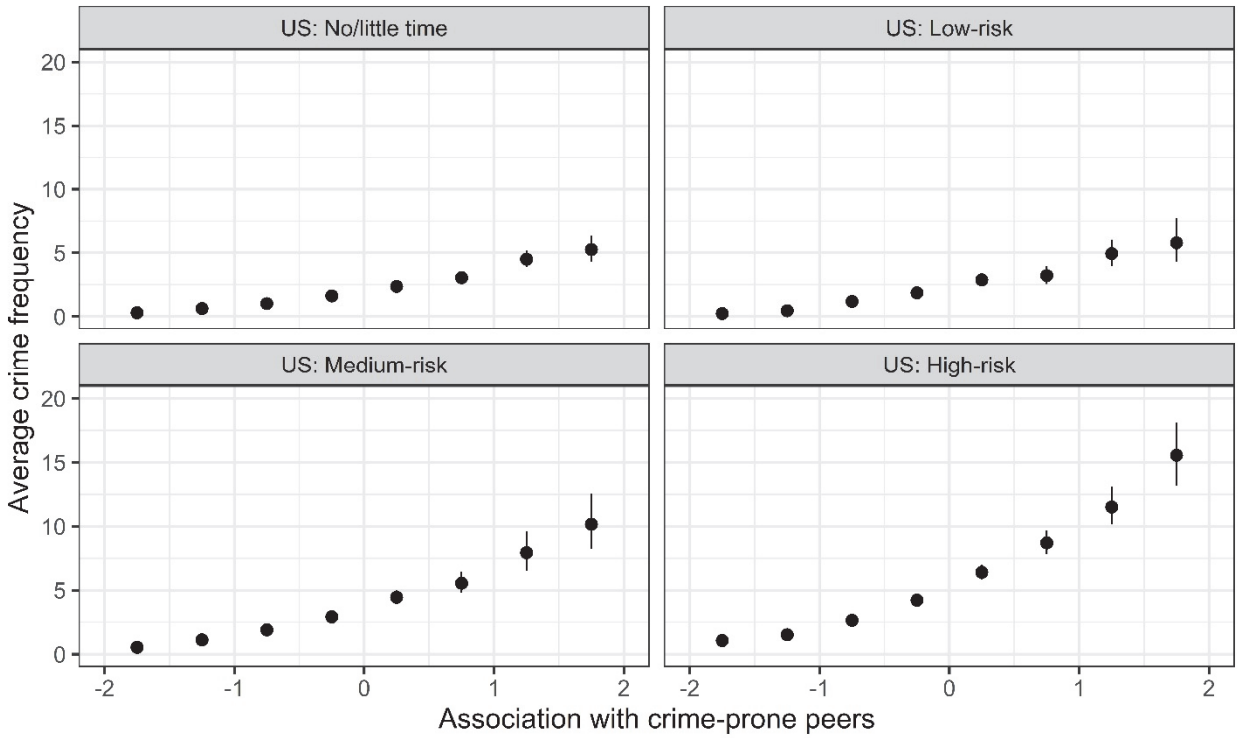
Table 36: Average marginal effects (main effects)

	AME
Differential peer associations	0.39 [0.32 0.47]
Unstructured socializing	
(ref. cat.: No/little time)	
Low-risk	0.00 [-0.21 0.23]
Medium-risk	0.70 [0.47 0.95]
High-risk	1.17 [0.93 1.44]
Personal morals	-0.62 [-0.70 -0.54]
Self-control	0.42 [0.35 0.51]
Panel wave	
(ref. cat.: 2003)	
2004	-0.37 [-0.56 -0.18]
2005	-0.78 [-0.97 -0.59]
2006	-1.09 [-1.28 -0.90]
N (interviews)	9,654

Note: The numbers in the brackets reflect 95% credible intervals.

8.3 How peer effects vary depending on unstructured socializing

Figure 22: Predictions of average crime frequencies (peer associations x unstructured socializing)



Note: The plot shows how the predictions of average crime frequencies vary along the dimension of differential peer associations, contingent on unstructured socializing. The black dots and lines reflect point and 95% credible interval predictions. The focal peer association variable was categorized into eight evenly spaced subsets (-2 to -1.5, -1.5 to -1, ..., 1.5 to 2) to predict the average crime frequencies with the observed-value approach. US = Unstructured socializing.

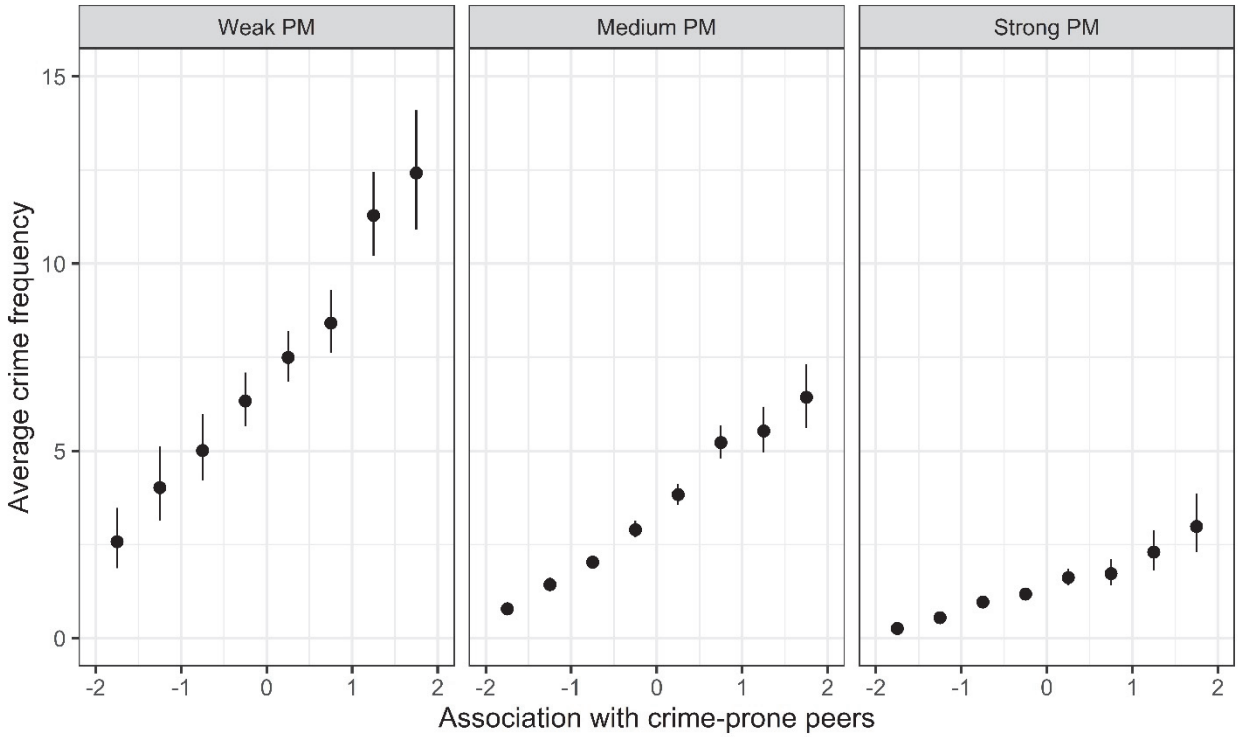
Table 37: Average marginal effects (of peer associations, contingent on unstructured socializing)

Unstructured socializing	**N**	**AME**	**Second differences**		
			No/little time	**Low-risk**	**Medium-risk**
No/little time	4,065	0.18 [0.12 0.25]			
Low-risk	1,833	0.34 [0.24 0.44]	0.16 [0.04 0.28]		
Medium-risk	1,936	0.53 [0.37 0.70]	0.35 [0.18 0.53]	0.19 [0.01 0.38]	
High-risk	1,820	0.78 [0.53 1.03]	0.60 [0.35 0.85]	0.44 [0.17 0.70]	0.25 [-0.03 0.53]

Note: The second differences reflect the difference between the AMEs of the subgroups in the first column of the table and the AMEs of the particular subset in the last three columns. The numbers in the brackets reflect 95% credible intervals.

8.4 How peer effects vary depending on personal morals

Figure 23: Predictions of average crime frequencies (peer associations x personal morals)



Note: The plot shows how the predictions of average crime frequencies vary along the dimension of differential peer associations, contingent on personal morals. The black dots and lines reflect point and 95% credible interval predictions. The focal peer association variable was categorized into eight evenly spaced subsets (-2 to -1.5, -1.5 to -1, …, 1.5 to 2) to predict the average crime frequencies with the observed-value approach. PM = Personal morals.

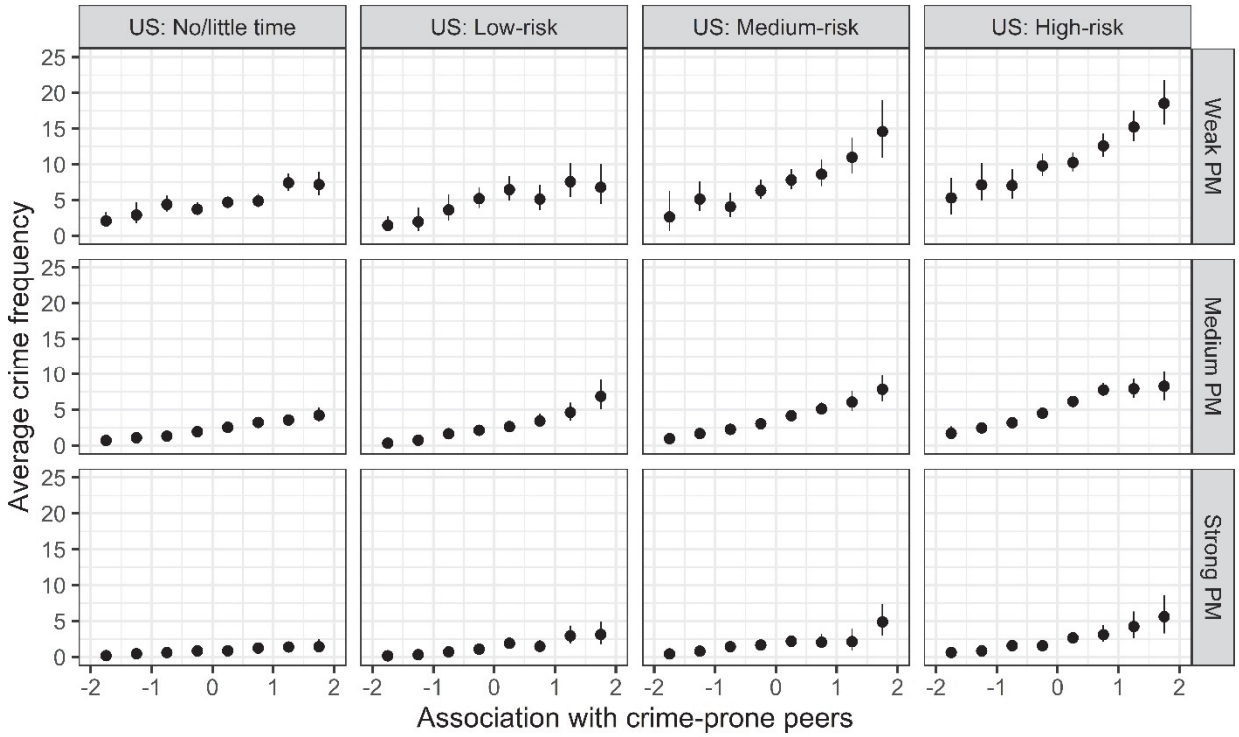
Table 38: Average marginal effects (of peer associations, contingent on personal morals)

Personal morals	N	AME	Second differences	
			Medium	Strong
Weak	973	0.89 [0.62 1.16]	0.35 [0.15 0.56]	0.68 [0.41 0.96]
Medium	3,529	0.53 [0.44 0.64]		0.33 [0.25 0.42]
Strong	5,152	0.20 [0.16 0.25]		

Note: The second differences reflect the difference between the AMEs of the subgroups in the first column of the table and the AMEs of the particular subset in the last three columns. The numbers in the brackets reflect 95% credible intervals.

8.5 How peer effects vary depending on unstructured socializing and personal morals

Figure 24: Predictions of average crime frequencies (peer associations x unstructured socializing x personal morals)



Note: The plot shows how the predictions of average crime frequencies vary along the dimension of differential peer associations, contingent on the combination of unstructured socializing and personal morals. The black dots and lines reflect point and 95% credible interval predictions. The focal peer association variable was categorized into eight evenly spaced subsets (-2 to -1.5, -1.5 to -1, ..., 1.5 to 2) to predict the average crime frequencies with the observed-value approach. US = Unstructured socializing. PM = Personal morals.

Table 39: Average marginal effects (of peer associations, contingent on unstructured socializing and personal morals)

Unstructured socializing	Personal morals	N	AME
No/little time	Weak	336	0.41 [0.15 0.71]
Low-risk	Weak	127	0.69 [0.29 1.16]
Medium-risk	Weak	176	1.16 [0.62 1.77]
High-risk	Weak	334	1.27 [0.68 1.88]
No/little time	Medium	1,327	0.25 [0.16 0.36]
Low-risk	Medium	521	0.49 [0.35 0.66]
Medium-risk	Medium	852	0.66 [0.46 0.88]
High-risk	Medium	829	0.87 [0.61 1.14]
No/little time	Strong	2,402	0.10 [0.06 0.14]
Low-risk	Strong	1,185	0.23 [0.16 0.31]
Medium-risk	Strong	908	0.28 [0.16 0.41]
High-risk	Strong	657	0.40 [0.25 0.57]

Note: The numbers in the brackets reflect 95% credible intervals.

Table 40: Second (AME) differences (of peer associations, contingent on unstructured socializing and personal morals)

Group 1		Group 2		Second Differences
Unstructured socializing	**Personal morals**	**Unstructured socializing**	**Personal morals**	**(AME_{Group1} -AME_{Group2})**
High-risk	Weak	Medium-risk	Weak	0.11 [-0.70 0.89]
High-risk	Weak	High-risk	Medium	0.40 [-0.01 0.84]
High-risk	Weak	Low-risk	Weak	0.59 [-0.18 1.33]
High-risk	Weak	Medium-risk	Medium	0.62 [0.00 1.26]
High-risk	Weak	No/little time	Weak	0.86 [0.23 1.50]
High-risk	Weak	Low-risk	Medium	0.78 [0.16 1.40]
High-risk	Weak	High-risk	Strong	0.87 [0.26 1.51]
High-risk	Weak	No/little time	Medium	1.02 [0.42 1.62]
High-risk	Weak	Medium-risk	Strong	0.99 [0.39 1.62]
High-risk	Weak	Low-risk	Strong	1.04 [0.43 1.66]
High-risk	Weak	No/little time	Strong	1.17 [0.57 1.78]
Medium-risk	Weak	High-risk	Medium	0.29 [-0.28 0.96]
Medium-risk	Weak	Low-risk	Weak	0.47 [-0.23 1.21]
Medium-risk	Weak	Medium-risk	Medium	0.51 [0.10 0.97]
Medium-risk	Weak	No/little time	Weak	0.75 [0.15 1.40]
Medium-risk	Weak	Low-risk	Medium	0.67 [0.12 1.29]
Medium-risk	Weak	High-risk	Strong	0.77 [0.20 1.40]
Medium-risk	Weak	No/little time	Medium	0.91 [0.36 1.52]
Medium-risk	Weak	Medium-risk	Strong	0.88 [0.31 1.53]
Medium-risk	Weak	Low-risk	Strong	0.93 [0.40 1.55]
Medium-risk	Weak	No/little time	Strong	1.06 [0.52 1.67]
High-risk	Medium	Low-risk	Weak	0.18 [-0.36 0.67]
High-risk	Medium	Medium-risk	Medium	0.21 [-0.11 0.53]
High-risk	Medium	No/little time	Weak	0.45 [0.08 0.82]
High-risk	Medium	Low-risk	Medium	0.37 [0.07 0.68]
High-risk	Medium	High-risk	Strong	0.47 [0.26 0.68]
High-risk	Medium	No/little time	Medium	0.62 [0.35 0.90]
High-risk	Medium	Medium-risk	Strong	0.59 [0.30 0.88]
High-risk	Medium	Low-risk	Strong	0.64 [0.37 0.92]
High-risk	Medium	No/little time	Strong	0.77 [0.51 1.04]
Low-risk	Weak	Medium-risk	Medium	0.03 [-0.42 0.53]
Low-risk	Weak	No/little time	Weak	0.28 [-0.22 0.79]
Low-risk	Weak	Low-risk	Medium	0.19 [-0.10 0.56]
Low-risk	Weak	High-risk	Strong	0.29 [-0.14 0.77]
Low-risk	Weak	No/little time	Medium	0.44 [0.03 0.90]
Low-risk	Weak	Medium-risk	Strong	0.41 [-0.01 0.90]
Low-risk	Weak	Low-risk	Strong	0.46 [0.07 0.93]
Low-risk	Weak	No/little time	Strong	0.59 [0.19 1.05]
Medium-risk	Medium	No/little time	Weak	0.24 [-0.10 0.57]
Medium-risk	Medium	Low-risk	Medium	0.16 [-0.08 0.42]
Medium-risk	Medium	High-risk	Strong	0.26 [0.00 0.51]
Medium-risk	Medium	No/little time	Medium	0.40 [0.19 0.64]
Medium-risk	Medium	Medium-risk	Strong	0.38 [0.21 0.57]
Medium-risk	Medium	Low-risk	Strong	0.43 [0.22 0.65]
Medium-risk	Medium	No/little time	Strong	0.55 [0.35 0.78]
No/little time	Weak	Low-risk	Medium	-0.08 [-0.37 0.24]
No/little time	Weak	High-risk	Strong	0.02 [-0.29 0.33]
No/little time	Weak	No/little time	Medium	0.16 [-0.03 0.38]
No/little time	Weak	Medium-risk	Strong	0.14 [-0.15 0.46]
No/little time	Weak	Low-risk	Strong	0.19 [-0.08 0.49]
No/little time	Weak	No/little time	Strong	0.31 [0.05 0.60]
Low-risk	Medium	High-risk	Strong	0.10 [-0.13 0.31]

Group 1		Group 2		Second Differences
Unstructured socializing	**Personal morals**	**Unstructured socializing**	**Personal morals**	**(AME_{Group1} -AME_{Group2})**
Low-risk	Medium	No/little time	Medium	0.24 [0.06 0.42]
Low-risk	Medium	Medium-risk	Strong	0.22 [0.02 0.41]
Low-risk	Medium	Low-risk	Strong	0.27 [0.15 0.40]
Low-risk	Medium	No/little time	Strong	0.39 [0.24 0.56]
High-risk	Strong	No/little time	Medium	0.14 [-0.02 0.33]
High-risk	Strong	Medium-risk	Strong	0.12 [-0.06 0.32]
High-risk	Strong	Low-risk	Strong	0.17 [0.00 0.35]
High-risk	Strong	No/little time	Strong	0.30 [0.15 0.47]
No/little time	Medium	Medium-risk	Strong	-0.02 [-0.18 0.13]
No/little time	Medium	Low-risk	Strong	0.03 [-0.09 0.15]
No/little time	Medium	No/little time	Strong	0.15 [0.08 0.23]
Medium-risk	Strong	Low-risk	Strong	0.05 [-0.09 0.20]
Medium-risk	Strong	No/little time	Strong	0.18 [0.05 0.31]
Low-risk	Strong	No/little time	Strong	0.12 [0.05 0.21]

Note: The groups are sorted by the size of their respective AME from the main article (see Table 4 in main article). The numbers in the brackets reflect 95% credible intervals.