

# Social relationship adversities throughout the life course and risk of loneliness in later life

## Supplementary materials

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# Social relationship adversities throughout the life course and risk of loneliness in later life

## Supplementary materials

### Supplementary materials (S1)- Logistic regression

Results from logistic regression classifying loneliness as scoring 6 or above on the UCLA loneliness measure

**Table 1. Odds Ratios (OR) estimates from multivariable logistic regression for social relationships variables predicting loneliness levels among the participants from the NSHD at age 68\***

Social relationship variables	OR (se)	t	OR (se)	t	OR (se)	t	OR (se)	t	OR (se)	t
Social adversity (childhood)	1.02 (0.01)	1.9					1.02 (0.01)	1.69	1.02 (0.01)	1.68
Social adversity (mid-adulthood)			1.02 (0.01)	4.17			1.02 (0.01)	3.32	1.02 (0.01)	3.15
Social adversity (later adulthood)					1.06 (0.01)	4.34	1.05 (0.01)	3.60	1.05 (0.01)	3.53
Contact with friends (age 68)									1.04 (0.01)	6.58
Contact with relatives (age 68)									1.03 (0.01)	4.88

\*controlled for gender, extroversion, neuroticism, childhood social status and number of childhood illnesses

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## Supplementary materials

**Table 2. Odds Ratios (OR) estimates from multivariable logistic regression for interactions between social relationships variables among the participants from the NSHD at age 68 \***

Interaction main effects	OR(se)	t	OR(se)	t	OR(se)	t	OR(se)	t	OR(se)	t
Social relationship adversity (childhood) x										
Social relationship adversity (mid adulthood)	1.01 (0.01)	1.73								
Social relationship adversity (later adulthood)			1.03 (0.02)	1.26						
Frequency of visiting friends (age 68)					1.00 (0.01)	0.44				
Frequency of visiting relatives (age 68)							1.03 (0.04)	0.72		
Quality of relationship with close confidante (age 68)									0.99 (0.00)	-1.7
Social relationship adversity (mid adulthood) x										
Social relationship adversity (later adulthood)			1.00 (0.01)	0.47						
Frequency of visiting friends (age 68)					1.01 (0.00)	1.83				
Frequency of visiting relatives (age 68)							1.00 (0.00)	0.46		
Quality of relationship with close confidante (age 68)									0.99 (0.00)	-2.0
Social relationship adversity (later adulthood) x										
Frequency of visiting friends (age 68)					1.04 (0.01)	3.28				
Frequency of visiting relatives (age 68)							1.04 (0.01)	3.76		
Quality of relationship with close confidante (age 68)									0.99 (0.00)	-1.35

\* adjusted for gender, extroversion, neuroticism, childhood social status, number of childhood illnesses, and the social relationship variables occurring earlier than the social adversity variable in question.

# Social relationship adversities throughout the life course and risk of loneliness in later life

## Supplementary materials

### Supplementary materials (S2) – removal of over 20% missing

Results from ordinary least squares analysis removing the 349 participants who had over 20% missing on social relationship adversity items

**Table 3. Standardized (B) multivariable OLS estimates for social relationships variables predicting loneliness levels among the 2104 remaining participants from the NSHD at age 68\***

Social relationship variables	B (se)	t	B (se)	t	B (se)	t	B (se)	t	B (se)	t
Social adversity (childhood)	0.05 (0.02)	2.4					0.05 (0.02)	2.2	0.05 (0.02)	2.2
Social adversity (mid-adulthood)			0.12 (0.02)	5.6			0.10 (0.02)	4.3	0.09 (0.02)	4.0
Social adversity (later adulthood)					0.14 (0.02)	6.2	0.12 (0.02)	5.1	0.11 (0.02)	5.0
Contact with friends (age 68)									0.18 (0.02)	8.5
Contact with relatives (age 68)									0.13 (0.02)	6.1

\* adjusted for gender, extroversion, neuroticism, childhood social status and number of childhood illnesses

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**Table 4. Standardized (B) multivariable OLS estimates for interactions between social relationships variables among the 2104 remaining participants from the NSHD at age 68**

Interaction main effects	B (se)	t	B (se)	t	B (se)	t	B (se)	t	B (se)	t
Social relationship adversity (childhood) x										
Social relationship adversity (mid adulthood)	0.05 (0.03)	1.73								
Social relationship adversity (later adulthood)			0.08 (0.08)	1.05						
Frequency of visiting friends (age 68)					0.01 (0.04)	0.29				
Frequency of visiting relatives (age 68)							0.03 (0.04)	0.72		
Quality of relationship with close confidante (age 68)									-0.02 (0.01)	-1.41
<hr/>										
Social relationship adversity (mid adulthood) x										
Social relationship adversity (later adulthood)			-0.01 (0.03)	-0.31						
Frequency of visiting friends (age 68)					0.02 (0.02)	1.13				
Frequency of visiting relatives (age 68)							0.02 (0.02)	1.13		
Quality of relationship with close confidante (age 68)									-0.01 (0.01)	-2.10
<hr/>										
Social relationship adversity (later adulthood) x										
Frequency of visiting friends (age 68)					0.17 (0.05)	3.74				
Frequency of visiting relatives (age 68)							0.19 (0.04)	4.31		
Quality of relationship with close confidante (age 68)									0.01 (0.01)	0.59

\* adjusted for gender, extroversion, neuroticism, childhood social status, number of childhood illnesses, and the social relationship variables occurring earlier than the social adversity variable in question.

# Social relationship adversities throughout the life course and risk of loneliness in later life

## Supplementary materials

### Supplementary materials (S2) – complete case analysis (n=1188)

Table 5. Standardized (B) multivariable OLS estimates for social relationships variables predicting loneliness levels among the participants from the NSHD at age 68 – Complete case analysis (n=1188).

Social relationship variables	Model 1a			Model 1b			Model 2a			Model 2b			Model 3a			Model 3b			Model 4		Model 5	
	B (se)*	B (se)**	t	B (se)*	B (se)**	t	B (se)*	B (se)**	t	B (se)*	B (se)**	t	B (se)*	B (se)**	t	B (se)**	t	B (se)**	t			
Social adversity (childhood)	0.09 (0.03)	0.06 (0.03)	2.0													0.05 (0.03)	1.7	0.04 (0.03)	1.5			
Social adversity (mid-adulthood)				0.10 (0.03)	0.16 (0.03)	5.5										0.13 (0.03)	4.5	0.12 (0.03)	4.1			
Social adversity (later adulthood)										0.20 (0.03)	0.16 (0.03)	5.5	0.13 (0.03)	4.4	0.13 (0.03)	4.4	0.13 (0.03)	4.5				
Contact with friends (age 68)																		0.20 (0.03)	6.6			
Contact with relatives (age 68)																		0.10 (0.03)	3.5			

\* adjusted for gender

\*\* adjusted for gender, extroversion, neuroticism, childhood social status and number of childhood illnesses

# Social relationship adversities throughout the life course and risk of loneliness in later life

## Supplementary materials

### Supplementary materials (S3) – single item analysis

Results from ordinary least squares analysis with each single item for childhood, mid-adulthood and later adulthood investigated separately

#### *Single items: Childhood*

**Table 6. Standardized (B) multivariable OLS estimates for single items social relationships variables in childhood predicting loneliness levels among the participants from the NSHD at age 68**

Variable	Model A*		Model B**	
	B (se)	t	B (se)	t
Separated from mother for more than three weeks (before age 6)	0.15 (0.11)	1.4	0.13 (0.1)	1.3
Tends to be ignored in school (age 13)	0.29 (0.15)	2	0.16 (0.14)	1.2
Unable to make friends (age 13)	0.33 (0.18)	1.8	0.17 (0.18)	0.94
Unable to make friends (age 15)	0.37 (0.2)	1.9	0.26 (0.19)	1.4
Difficulties with other children in school (age 9 or 10)	0.25 (0.13)	1.9	0.18 (0.13)	1.4
Death of mother (before age 18)	0.074 (0.19)	0.4	0.075 (0.18)	0.42
Death of father (before age 18)	-0.064 (0.12)	-0.52	-0.061 (0.12)	-0.52
Divorce of parents (before age 18)	0.11 (0.12)	0.91	0.051 (0.12)	0.43

\* adjusted for gender

\*\* adjusted for gender, extroversion, neuroticism, childhood social status and number of childhood illnesses

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### *Single item analysis: Mid-adulthood*

**Table 7 Standardized (B) multivariable OLS estimates for single items social relationships variables in mid-adulthood predicting loneliness levels among the participants from the NSHD at age 68**

Variable	Model A*		Model B**	
	B (se)	t	B (se)	t
Friend/relative died (age 36)	-0.02 (0.061)	-0.33	-0.00 (0.06)	-0.13
Friend/relative died (age 43)	0.14 (0.065)	2.2	0.1 (0.06)	1.6
Lost contact with friend/relative (age 43)	0.32 (0.12)	2.7	0.24 (0.11)	2.1
Serious disagreement partner (age 43)	0.22 (0.12)	1.9	0.09 (0.11)	0.8
Difficulties with children (age 43)	0.048 (0.082)	0.59	-0.08 (0.08)	-1
Serious disagreement friend/relative (age 43)	0.45 (0.1)	4.4	0.31 (0.1)	3.1
Serious disagreements with family or close friends (age 53)	0.46 (0.1)	4.4	0.31 (0.1)	3.1
Difficulties with children (age 53)	0.23 (0.084)	2.7	0.13 (0.08)	1.6
Friend/relative died (age 53)	-0.00 (0.06)	-0.085	0.00 (0.06)	0.013
Lost contact with friend/relative (age 53)	0.38 (0.12)	3.2	0.21 (0.12)	1.8
Partner had serious accident/illness (age 53)	0.35 (0.11)	3.3	0.25 (0.1)	2.4
Number of times widowed (age 36-53)	0.39 (0.14)	2.7	0.51 (0.13)	3.8
Number of divorces (age 36-53)	0.1 (0.07)	1.5	0.06 (0.06)	0.98

\* adjusted for gender

\*\* adjusted for gender, extroversion, neuroticism, childhood social status and number of childhood illnesses



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### *Single item analysis: Later adulthood*

**Table 8. Standardized (B) multivariable OLS estimates for single items social relationships variables in later adulthood predicting loneliness levels among the participants from the NSHD at age 68**

Variable	Model A*		Model B**	
	B (se)	t	B (se)	t
Serious disagreements partner (age 60-64)	0.4 (0.15)	2.7	0.31 (0.15)	2.1
Serious disagreements with family or close friends (age 60-64)	0.7 (0.14)	5.1	0.55 (0.13)	4.2
Lost contact with friend/relative (age 60-64)	0.57 (0.14)	4	0.47 (0.14)	3.5
Serious disagreements children (age 60-64)	0.24 (0.1)	2.4	0.16 (0.099)	1.6
Number of divorces (age 54-64)	-0.059 (0.63)	-0.094	-0.19 (0.6)	-0.32
Number of times widowed (age 54-64)	0.073 (0.33)	0.22	0.36 (0.32)	1.1

\* adjusted for gender

\*\* adjusted for gender, extroversion, neuroticism, childhood social status and number of childhood illnesses

# Social relationship adversities throughout the life course and risk of loneliness in later life

## Supplementary materials

### Supplementary materials (S4) – Gender interaction

Results from ordinary least squares analysis for gender moderation.

**Table 9. Standardized (B) multivariable OLS estimates for interactions between social relationships variables among the participants from the NSHD at age 68\***

Interaction	B (se)	t	B (se)	t	B (se)	t
Gender x						
Social relationship adversity (childhood)	0.78 (0.53)	1.48				
Social relationship adversity (mid-adulthood)			-0.20 (0.34)	- 0.59		
Social relationship adversity (later adulthood)					-0.35 (0.64)	-0.6

\* adjusted for gender, extroversion, neuroticism, childhood social status, number of childhood illnesses, and the social relationship variables occurring earlier than the social adversity variable in question and the three way interaction between the social relationship variable.