Environmental Sensitivity in Children

Concept & Measurement

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Environmental Sensitivity

- Environmental Sensitivity is a fundamental trait found in most species, including humans:
  - ***Ability to register and process external stimuli***
- Do all people have the same degree of Environmental Sensitivity?
  - Differences in Environmental Sensitivity are widely observable and are reflected in many psychological concepts
    - E.g.: Behavioural inhibition, introversion etc.

→ **Individuals differ fundamentally in how they perceive and process environmental features, with some being generally more and some generally less sensitive**

Pluess, M. (2015). Individual Differences in Environmental Sensitivity. *Child Development Perspectives, 9*(3), 138-143.

Differential Susceptibility
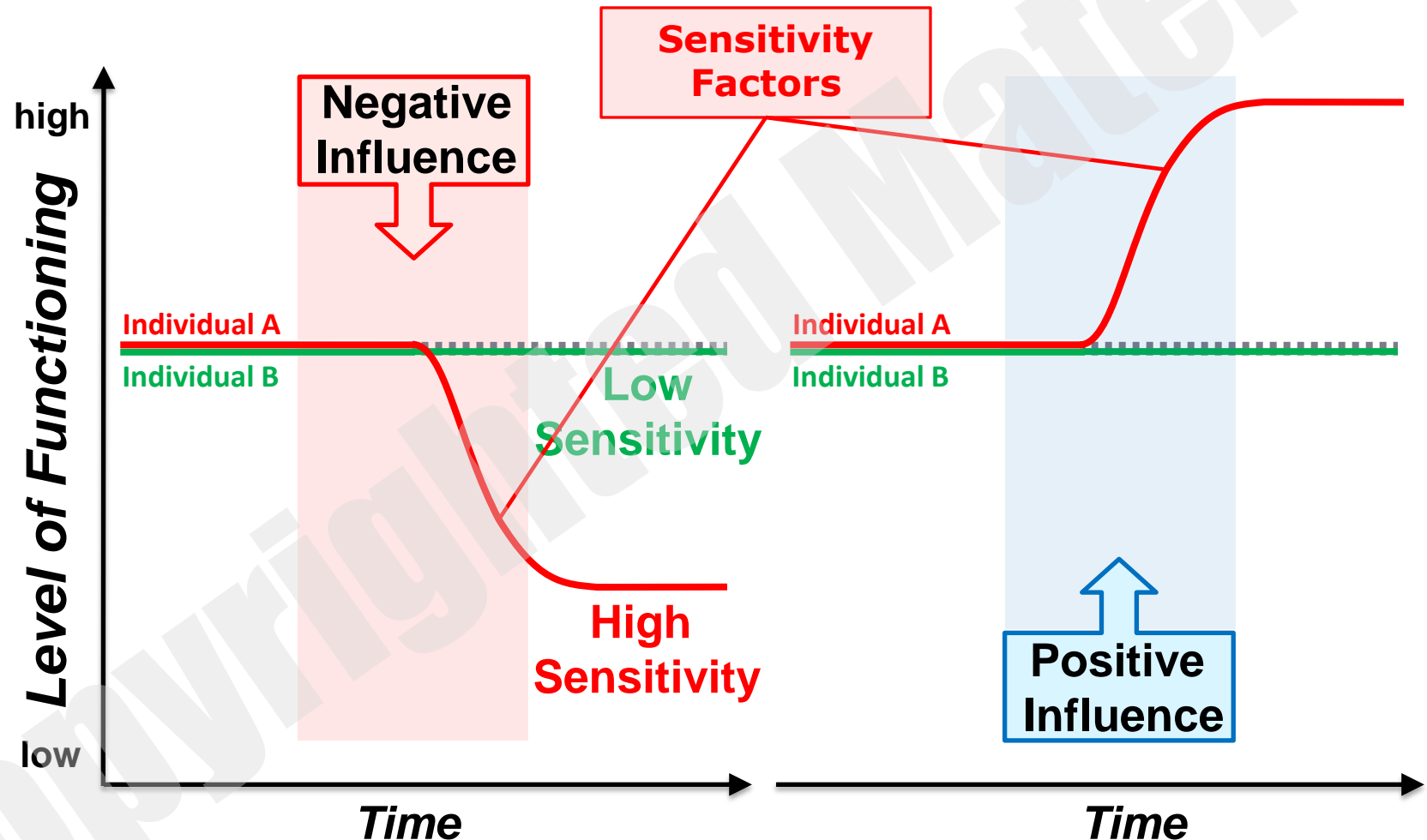
Belsky, J. & Pluess, M. (2009). Beyond Diathesis-Stress: Differential Susceptibility to Environmental Influences. *Psychological Bulletin, 135*(6), 885-908.

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Sensory Processing Sensitivity (SPS)

- Elaine Aron (Aron, 1996)

- **Sensory Processing Sensitivity**
  - Highly Sensitive Person (HSP)
  - Common personality trait (ca.20%):
    - more aware of subtleties in his/her surroundings
    - processing experiences more deeply
    - is more easily overwhelmed when in a highly stimulating environment
  - Facets of SPS:
    - Behavioural Inhibition
    - Sensory Sensitivity
    - Depth of Cognitive Processing
    - Emotional/Physiological Reactivity

Aron, E. ... & Jagiellowicz, J. (2012). Sensory processing sensitivity: a review in the light of the evolution of biological responsivity. *Personality and Social Psychology Review,* 16(3), 262-282.

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Highly Sensitive Person Scale

- Original scale with 27 items (Aron & Aron, 1997)
  - Brief versions for adults and children

INSTRUCTIONS: Answer each question according to the way you personally feel, using the following scale:

1	2	3	4	5	6	7
Not at All			Moderately			Extremely

1. I notice when small things have changed in my environment
2. Loud noises make me feel uncomfortable
3. I love nice smells
4. I get nervous when I have to do a lot in little time
5. Some music can make me really happy
6. I am annoyed when people try to get me to do too many things at once
7. I don't like watching TV programs that have a lot of violence in them
8. I find it unpleasant to have a lot going on at once
9. I don't like it when things change in my life
10. I love nice tastes
11. I don't like loud noises
12. When someone observes me, I get nervous. This makes me perform worse than normal

Pluess, M., et al. (submitted). **Environmental Sensitivity in Children: Development of the Highly Sensitive Child Scale and Identification of Sensitivity Groups.**

Highly Sensitive Child Scale

- **Psychometrics of HSC**
  - Internal consistency: **alpha=.79**
  - Factor analysis: **3 factors**
    - **Ease of Excitation, Low Sensory Threshold, Aesthetic Sensitivity**

Rotated Component Matrix[a]

	Component		
	1	2	3
I find it unpleasant to have a lot going on at once	.073	.528	.149
Some music can make me really happy	.789	.040	-.023
I love nice tastes	.826	.178	.000
Loud noises make me feel uncomfortable	.015	.354	.671
I am annoyed when people try to get me to do too many things at once	.257	.714	-.019
I notice it when small things have changed in my environment	.438	.292	.032
I get nervous when I have to do a lot in little time	.262	.663	.227
I love nice smells	.792	.126	.237
I don't like watching TV programs that have a lot of violence in them	.037	.051	.662
I don't like loud noises	.058	.102	.863
I don't like it when things change in my life	.217	.478	.445
When someone observes me, I get nervous. This makes me perform worse than normal	.003	.703	.144

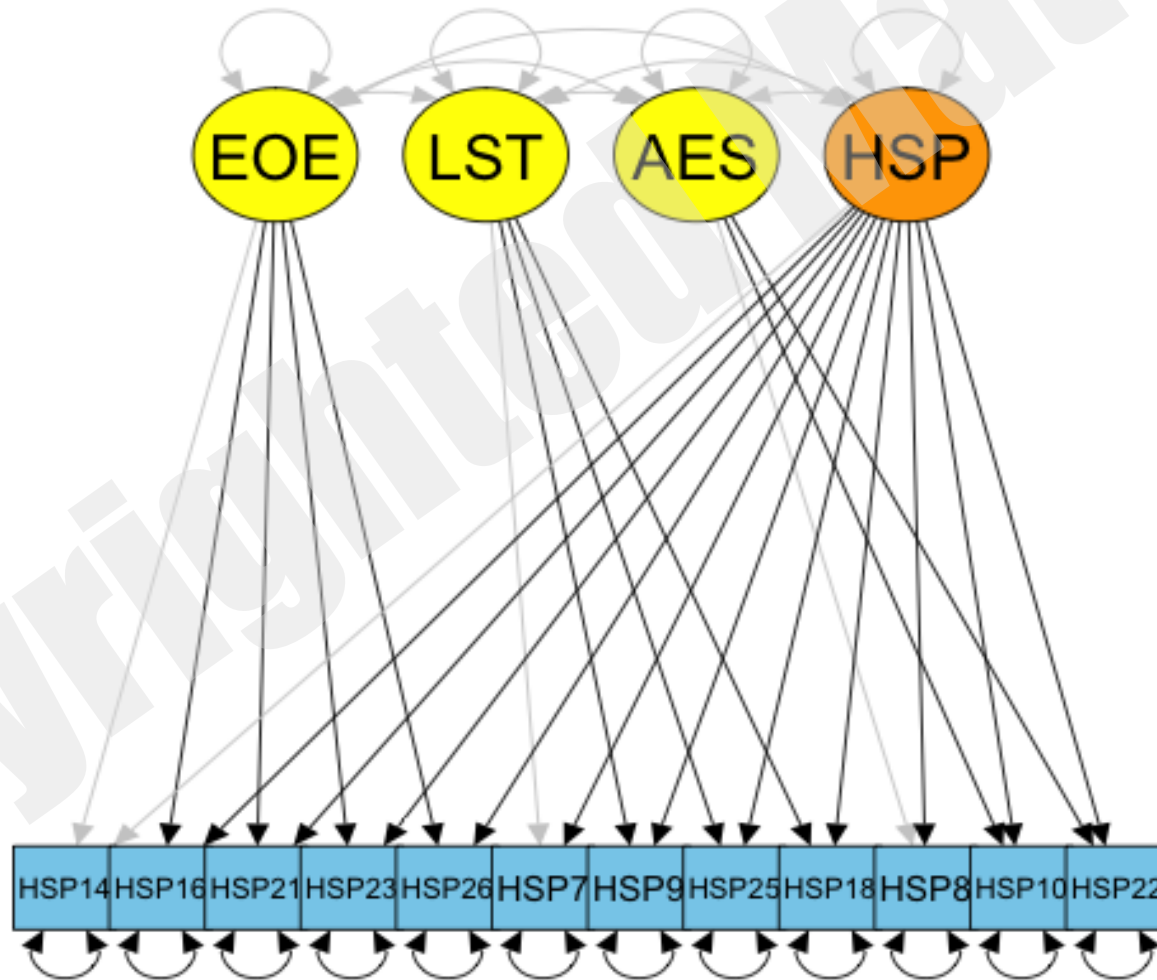Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 5 iterations.

Highly Sensitive Child Scale

- **Psychometrics of HSC**
  - **Bifactor Structure**

Highly Sensitive Child Scale

- **Test-Retest Reliability of HSC**
  - **N = 104** 8-11 year old children (M = 9.82)
  - HSC assessed twice 2-3 weeks apart (M = 15 days)

	r
HSC SHORT	.68**
HSC_EOE	.66**
HSC_AES	.57**
HSC_LST	.78**

Associations with Other Constructs

- **N= 285** 11-12 year old pupils at two schools in East London

		1	2	3	4	5	6	7	8	9	10	11
1	HSC_LONG											
2	HSC_SHORT	.93**	-									
3	HSC_EOE	.80**	.86**	-								
4	HSC_AES	.68**	.71**	.43**	-							
5	HSC_LST	.63**	.70**	.44**	.18**	-						
6	BIS	.46**	.50**	.44**	.32**	.35**	-					
7	BAS	.42**	.41**	.31**	.50**	.11	.37**	-				
8	Effortful Control	< .01	-.02	-.23**	.19**	.05	< .01	.1	-			
9	Negative Emotionality	.38**	.37**	.36**	.19**	.26**	.42**	.21**	-.22**	-		
10	Positive Emotionality	.26**	.24**	.13*	.39**	.03	.20**	.41**	.11	.51**	-	
11	Positive Affect	.16**	.14*	-.01	.41**	-.06	.02	.38**	.28**	.08	.36**	-
12	Negative Affect	.15*	.09	.16**	-.09	.13*	.13*	-.08	-.19**	.19**	.03	-.38**

Associations with Other Constructs

- **N= 285** 11-12 year old pupils at two schools in East London

Table 4. Linear Regression: BISBAS, temperament and PANAS predicting HSC

Predictor variables	Standardized Coefficients Beta
BIS	.32**
BAS	.25**
EC	.00
NE	.19*
PE	-.06
PA	.07
NA	.06

adjusted R^2=. 32, F (7, 255) = 18.42, p<.001

Associations with Other Constructs

- **TEDS**
  - **N = 586** 16 year olds

	HSC	EOE	AES	LST
Neuroticism	.31**	.38**	-.10	.23**
Extraversion	-.18**	-.28**	.21**	-.22**
Openness	.16**	.02	.25**	.15**
Agreeableness	.02	-.04	.04	.08
Conscientiousness	-.10	-.13**	.16**	.04

Associations with Other Constructs

- **TEDS**
  - **N = 586** 16 year olds

Table 10. Linear Regression: Personality predicting HSC

Predictor variables	Standardized Coefficients Beta
Neuroticism	.29**
Extraversion	-.15**
Openness	.20**
Agreeableness	.04
Conscientiousness	.05

** $p < .001$

adjusted $R^2 = .14$, F (5, 578) = 20.15, p<.001

Highly Sensitive Child Scale

- **Are there different sensitivity subgroups?**
  - Test with Latent Class Analysis
    - **N = 1469** 16-year old Children (TEDS)
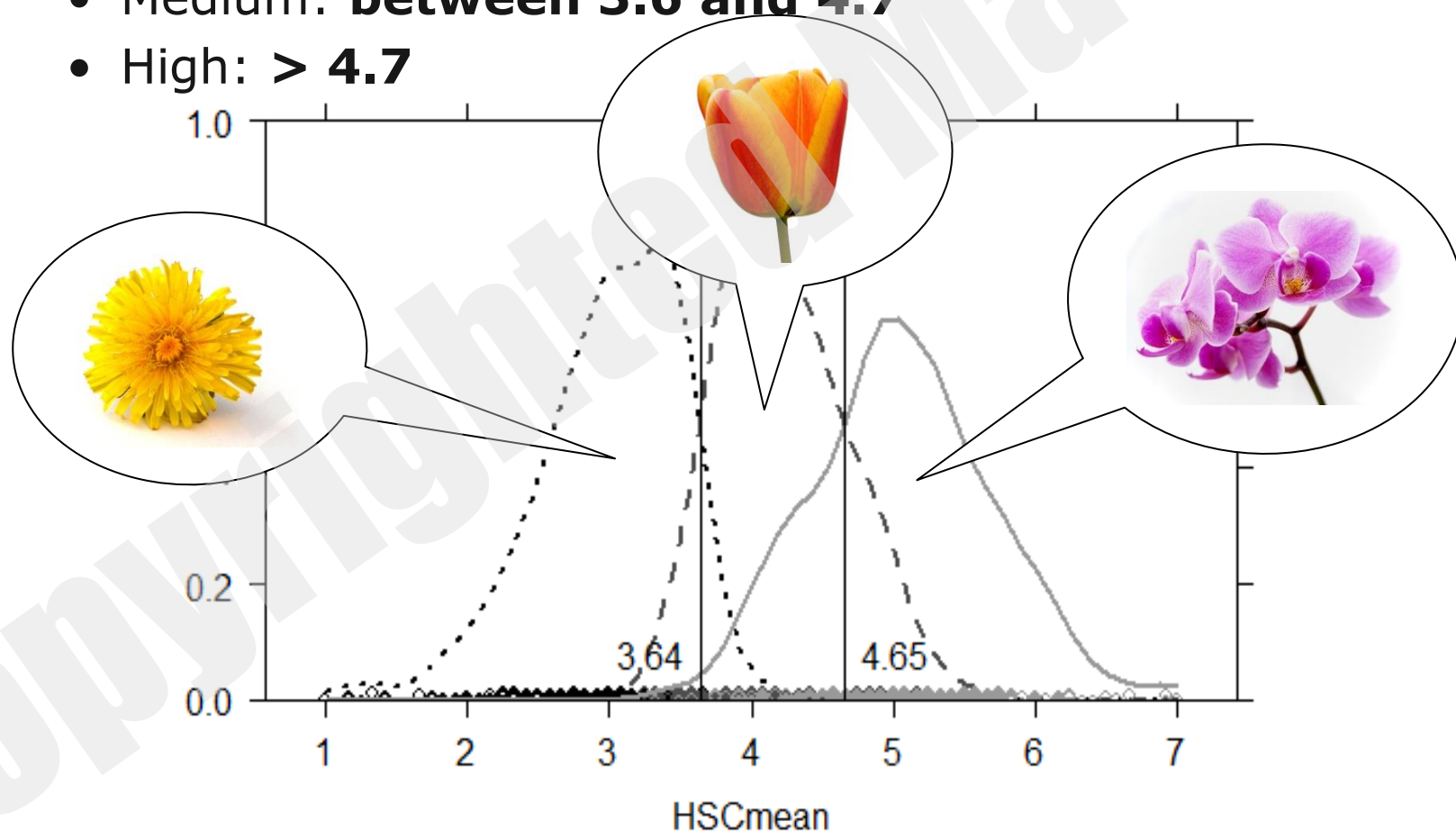 - Three class solution had the best fit
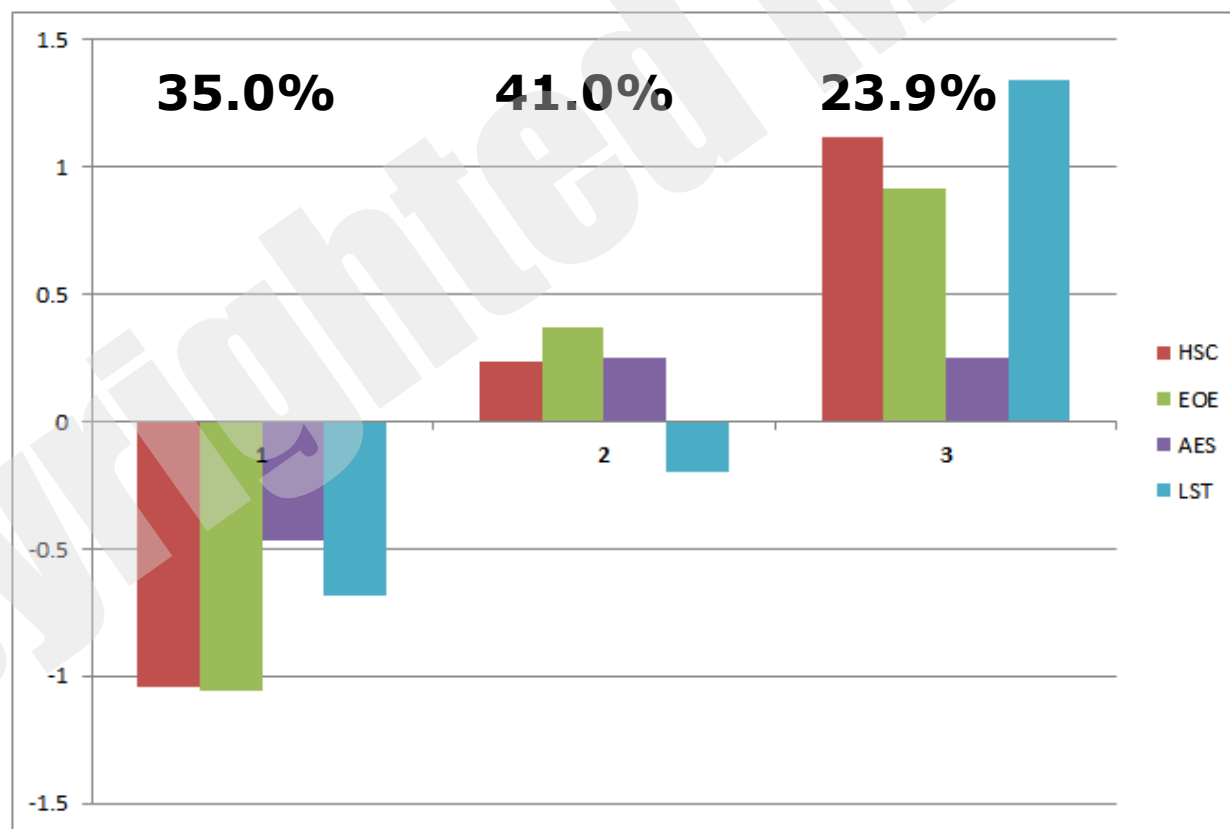
Highly Sensitive Child Scale

- **Cut-off scores for the different groups?**
  - Low: **< 3.6**
  - Medium: **between 3.6 and 4.7**
  - High: **> 4.7**

Highly Sensitive Child Scale

- ## Born to be Sensitive? (Assary et al., in preparation)

	A	C	E
HSC	.47 (.30,.53)	.00 (.00,.13)	.53 (.47,.59)
EOE	.42 (.23,.48)	.01 (.00,.14)	.58 (.52,.65)
AES	.36 (.25,.42)	.00 (.00,.07)	.64 (.58,.71)
LST	.41 (.27,.47)	.00 (.00,.00)	.59 (.53,.65)

47%
explained by heritable factors

53%
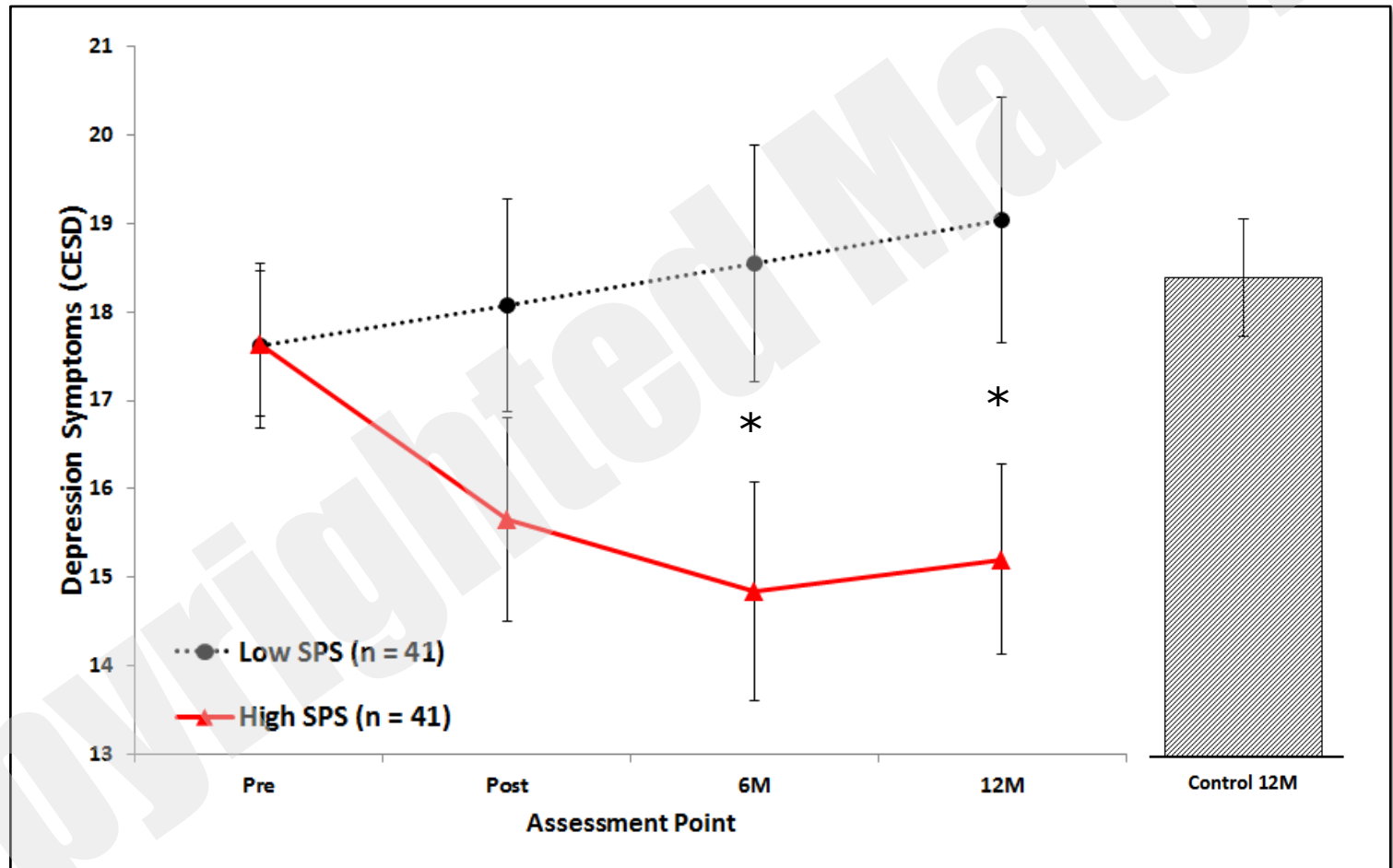**explained by environmental factors**

Does High Sensitivity Moderate Environmental Effects?

HSC and Response to Intervention
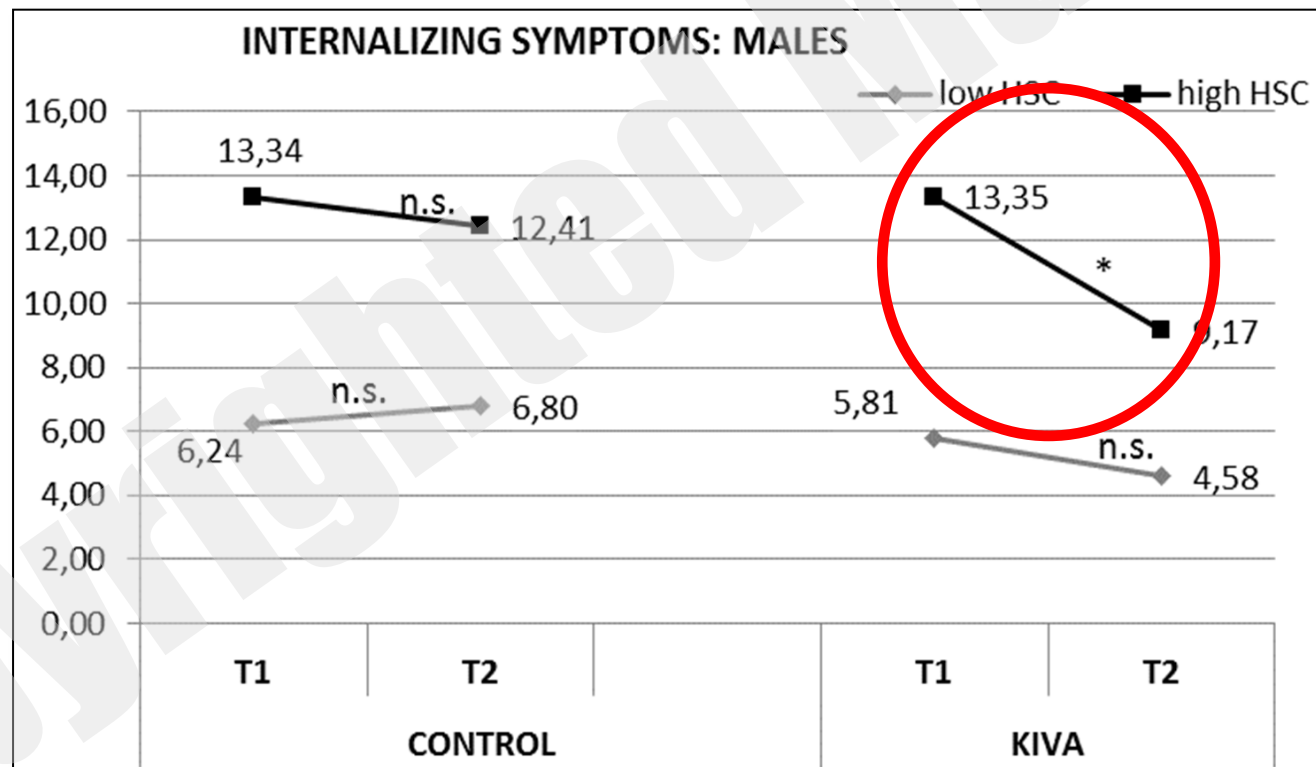
- ▪ **Resilience Intervention**

Pluess, M., & Boniwell, I. (2015). Sensory-Processing Sensitivity predicts treatment response to a school-based depression prevention program: Evidence of Vantage Sensitivity. *Personality and Individual Differences, 82*(0), 40-45.

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HSC and Response to Intervention

- **Anti-Bullying Intervention (Kiva)**
  - N = 931 (control = 461; treatment = 460)
  - Significant interaction: group X time X HSC X gender

INTERNALIZING SYMPTOMS: MALES

low HSC — high HSC

CONTROL: T1 13,34 → T2 12,41 (n.s.) [high HSC]
CONTROL: T1 6,24 → T2 6,80 (n.s.) [low HSC]
KIVA: T1 13,35 → T2 9,17 (*) [high HSC]
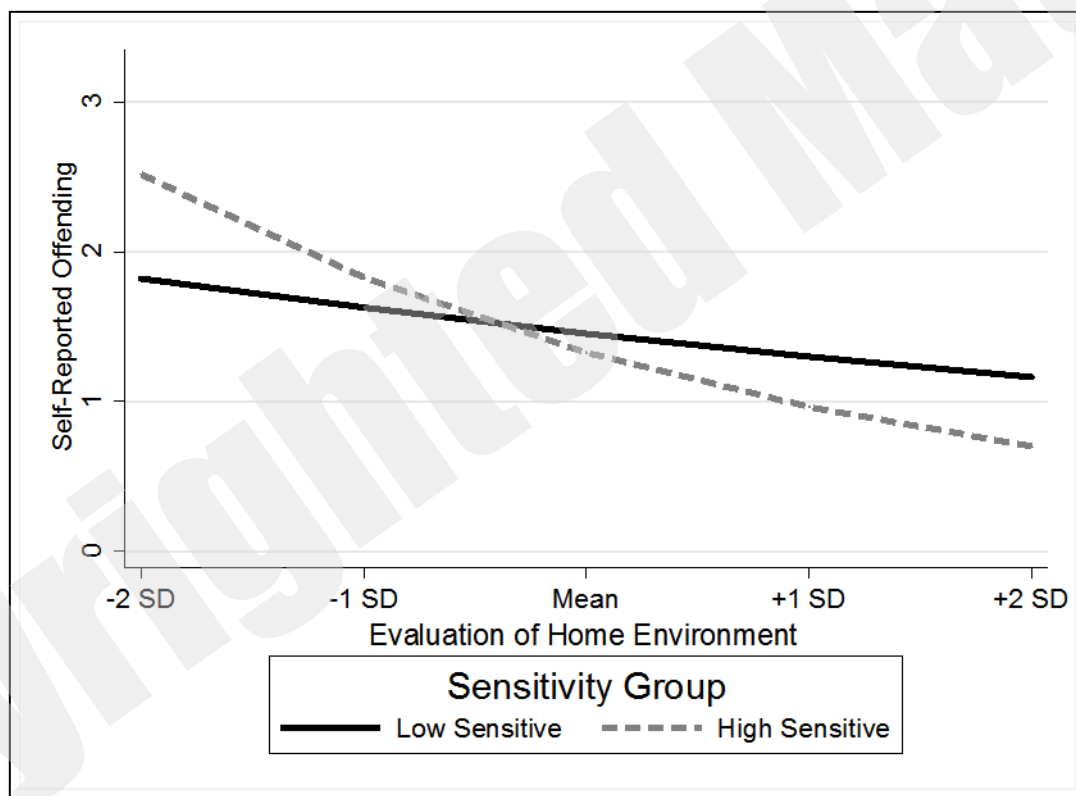KIVA: T1 5,81 → T2 4,58 (n.s.) [low HSC]

Nocentini, A., Menesini, E., & Pluess, M. (in preparation). Environmental Sensitivity Predicts Treatment Response to Anti-Bullying Intervention: Evidence of Vantage Sensitivity

HSC and Environmental Context

- **Reoffending of Juvenile Offenders**
  - N = 1,216 male youth offenders, 13-17 years old

Donley, S. V., Fine., A., Simmons, C., Pluess., M., & Cauffman, E. (in preparation). Environmental Sensitivity Predicts Reoffending among Juvenile Offenders: Evidence for Vantage Sensitivity to High Quality Environments

Summary

→ Environmental Sensitivity **can be measured with a questionnaire**

→ Environmental Sensitivity is relatively **independent from other related constructs**

→ Individuals fall into **three sensitivity categories: high, medium, low**

→ Environmental Sensitivity **moderates the effects** of intervention and environmental quality

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Thank you for your attention!

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