

Cognitive Sciences and Child Poverty: Facts and Challenges

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Objective of present paper

Starting a reflective debate on the implicit and explicit conceptual and methodological assumptions underlying the current neurocognitive research on social inequality

This is intended as a criticism of the field targeting no one in particular and including the present authors!

State of the art and why we need epistemological reflection now

FOCUS ON:

- Challenges in research interpretations
- “Cart before the horse” interventions
- Ethical paradox
- Media divulgation

Definitional Issues

- Absolute vs. Relative Poverty (Paradox in Developed countries as Canada)
- Indirect measurement in children, Socioeconomic status (SES) is measured in parents
- SES gradients vs. Extreme Groups Approach (EGA): Low, Middle and High SES: Poverty is just a cut off according to the EGA
- Low SES is poverty in the gradient perspective (although includes a wider interval it does include the extreme, lowest end of the distribution)

I WILL CONSIDER THIS LATTER ONE

Challenge: Implicit (often unintentional) Deficit Attribution

- **The IMPLICIT general consensus in interpreting the literature results has been that low SES is almost necessarily associated with both cognitive/behavioural pathologies or deficits.**

Deficit Attribution – Example 0

The risk is not only for the clear economic and health problems of being poor but also that their brains will fail to develop to their full potential. [...] the risk from multiple influences of systemic poverty is that these children will suffer not only from loss of opportunity but from poor development of their nervous systems (Posner, 2010; underline added).

Deficit Attribution – Example 1

"Kids from lower socioeconomic levels show brain physiology patterns similar to someone who Actually had damage in the frontal lobe as an adult..."
(US Berkeley News, 2008).

Deficit Attribution – Example 2

lower-SES children may need to exert more effort (resources) to perform like their higher-SES counterparts. In more complex tasks, *where these children may be unable to deploy early selection to single out appropriate features* (presumably more automatically), resources deployed for late selection may compromise the ability to manage information load and higher-order processing (D'Angiulli et al., 2008, p. 299)

Deficit Attribution – Example 3

Deficits and adaptations

Differences in neural processing that lead to performance *deficits* in laboratory tasks could, in certain contexts, be useful adaptations. Future research should, in interpretation and design, expressly consider the context of performance and processing strategies and investigate possible strengths and weaknesses.

(Hackman & Farah, 2009, p. 70 Note: bold emphasis added).

Methodological challenges, behavior

- the differences between low- and high-SES children on some ability and lab tests don't necessarily or predominantly reflect differences in the assumed simple neurocognitive operations
- Simple Broad Neuropsychological Systems can only be indirectly/correlationally linked to focal brain functions without concurrent neuroimaging evidence at the same level of "resolution"

Methodological challenges, neurophysiology

- Most neuroimaging differences between Low vs. high SES children are obtained with similar performance levels, controlled or equated
- The interpretation of some brain signatures (ERP waves) are “validated” with respect to similarity to adult pathological conditions (stroke patients), so where’s the lesion?
- Correspondence between levels of functions and brain activation, must be shown in context and concurrently

Interventions, putting the cart before the horse

Observed neural differences are used to argue that low-SES children have neurocognitive impairments even if we are not sure about what they really are

“...even when performance differences do not emerge between lower and higher SES individuals, there are differences in the degree to which specific neural systems are recruited...” Hackman & Farah, 2009, p.67)

and this by default needs intervention/remediation “...to *protect and foster the neurocognitive development of low SES children...*” (Hackman & Farah, 2009, p. 71).

Issues with Poverty as Deprivation

- Delay may reflect maturational plasticity (“late blooming” effects) or alternate pathways in relative poverty
- Intellectual deprivation refers to the kind and not to quantity of stimulation. What poor children may be deprived of is the same kind of stimulation expected in middle-high SES children, the one that will prepare them to do well in tests and school (Elkind, 1971; p. 73)

All interventions in the same basket?

- Multimodular interventions are complex and include context not just lab effects
- No real Cognitive Neuroscience interventions have been validated (generally small samples)
- No intervention has been put in correspondence with neurocognitive improvement, given a lesion or neuro deficit

Ethical paradox

- High-SES children experience socioemotional issues related to atypical development (Luthar and Latendresse, 2005)
- However, High-SES children are not by default seen as eligible for intervention.
- Why? We argue: any other group *except* low SES may be seen as the “Normative” group.

Communicating with the Media: A dangerous affair

- Myths and stereotypes about poverty
- Oversimplification of poverty
- Overgeneralization that discount wide individual differences among low-SES and poor children and families



[Bernardino Poccetti](#), *Strage degli innocenti* (dettaglio),
1610

Conclusions

- Facts: From the current state of the art we can only conclude low SES and relatively poor children show different neurocognitive pathways than middle-SES children
- We need to elaborate proper conceptualization of such differences, differences cannot be interpreted as deficits and could be adaptive
- There needs to be a more critical debate about interventions, especially early interventions and the evaluation of success