

Cognitive Bases of Emotional Intelligence: Emotional Stroop Effect

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In search of cognitive bases of EI

EI is often defined as a set of cognitive abilities to perceive, understand, and manage emotions.

What cognitive processes underlie EI?

Hypothesis of specificity of emotional information processing (*Austin, 2005*).

Search for relations between EI and cognitive tasks that demand processing emotional stimuli.

Cognitive tasks that are supposed to be correlates of EI:

- Inspection time tasks (*Austin, 2005; Farrelly, Austin, 2007*)
- Visual search tasks (*Matthews et al., 2008*)
- Dot probe task (*Mikolajczak et al., 2009*)

Emotional Stroop Effect (ESE)

Emotional Stroop task: naming the colour of the ink in which the word is printed

Two types of stimuli: emotionally laden words vs. emotionally neutral words

Emotional Stroop Effect: RTs for emotional words are slower than RTs for neutral words

Emotional Stroop Stimuli

Threatening words

Neutral words

VIOLENCE

TORTURE

SCREAM

ANXIETY

VICTIM

GRENADE

STRESS

PANIC

LIST

ADDRESS

SECTION

LOGIC

SPACE

REASON

DIVISION

CORN

Explanations of ESE

1. Competition between two paths of information processing (word reading interferes with colour naming) (*cf. Cohen et al., 1990*)
2. Generic slowdown (*Algom et al., 2004*)

Emotional Intelligence and Emotional Stroop Effect

How should they be related?

Two interpretations of ESE:

- ESE as an indicator of maladaptation; typical for people with emotional disorders

→ *Negative correlation with EI*

- ESE as an indicator of the extent of automatic attention towards emotional aspects of stimulation

→ *Positive correlation with EI*

There exists theoretical and empirical evidence for **both** positive and negative correlations between EI and ESE

EI and Emotional Stroop Effect: Negative correlation

Theoretical ideas:

- “Part of emotional facilitation is to know how to include emotions in, and exclude emotions from, thought... Those with higher EI might exhibit less interference from the emotion words” (*Mayer, Roberts, & Barsade, 2008, p. 512*)
- “Emotionally intelligent individuals are more effective in handling the emotional aspects of their lives and, as a result, are less influenced by the negative emotional words on the Stroop task” (*Martin & Thomas, 2011, p. 212*)

Empirical evidence:

Martin & Thomas, 2011: Neutral vs. dysphoric words in Emotional Stroop Task. MSCEIT was negatively correlated with the ESE: $r = -0.27$, $p < 0.01$

EI and Emotional Stroop Effect: Positive correlation

Theoretical ideas:

- ESE is regarded as the degree to which individuals attend to emotional information. (*Coffey, Berenbaum & Kerns, 2003*)
- “Focusing on one’s own emotions may prime the individual to perceive emotional stimuli earlier than those with low attention to emotions” (*Fisher et al., 2010*)

Empirical evidence:

Coffey, Berenbaum & Kerns, 2003: Positive + negative vs. neutral words in Emotional Stroop Task. Correlation between ‘Attention to one’s own emotions’ (self-report) and Emotional Stroop: $r=0.15$, $p<0.05$

Aim

To clarify the direction of correlations between ESE and EI measured by self-report and objective methods

Participants

- N = 272
- 105 male, 167 female
- Age: 13–17 (M = 15.2, SD = 0.92)

Measures

- Emotional Stroop Task, N = 272
- EmIn Questionnaire (Lyusin, 2006), N = 155
- Videotest (Ovsyannikova & Lyusin, 2009), N = 220

Emotional Stroop Task

- 16 neutral and 16 threatening words
- Word groups were equal in frequency and length
- Four colours: red, green, blue, yellow (on black background)
- Blocked presentation format
- Verbal response
- ESE was calculated as the difference between mean RTs for threatening and neutral words

Emln Questionnaire

46 items

General EI Score	Interpersonal EI	Intrapersonal EI
Emotion Perception	Recognition of Others' Emotions	Recognition of One's Own Emotions
Emotion Management	Management of Others' Emotions	- Management of One's Own Emotions - Control of Emotional Expression

Videotest of EI



- 7 videos
- Character's behavior in everyday situations
- 15 Likert-type scales (emotion terms)
- Indices of accuracy of emotion recognition

Emotional Stroop Effect

Emotional Stroop Effect was obtained

Mean RT, neutral words, ms	Mean RT, threatening words, ms	Mean ESE, ms	Wilcoxon test
572	588	16	$z=-4,09,$ $p<0,001$

Variability of individual indices of ESE (ms) was rather high

Minimum	Maximum	Mean	SD
-200	296	16	64

Correlations between EI and ESE

- Correlation between ESE and general scores of the EmIn Questionnaire: $r=0.18$, $p<0.05$ (N=155)
- Correlation between ESE and the subscale Management of One's Own Emotions: $r=0.19$, $p<0.05$ (N=155)
- No correlations between the Videotest of EI and ESE were found

Direct vs. Reversed ESE

- Two contrast groups by ESE scores were singled out:
 - The group with strong ***direct ESE*** (ESE > 51 ms, N=69)
 - The group with strong ***reversed ESE*** (ESE < -23 ms, N=68)
- There were no differences in mean EI scores between contrast groups
- In the group with direct ESE a moderate positive correlation between ESE and the subscale Management of One's Own Emotions was found: $r=0.34$, $p<0.05$ (N=41)
- In the group with reversed ESE no significant correlations were found (N=41)

Discussion

It is reasonable to distinguish at least two groups of participants with different reactions to threatening words:

Direct ESE processing of threatening stimuli disrupts other cognitive activities (generic slowdown or interference to colour naming)

Reversed ESE threatening stimuli attract attention but don't disrupt other cognitive activities

Generic slowdown might be adaptive for emotion management because in case of threat individuals concentrate their resources on dealing with their own emotions

Discussion

Our results in general correspond to the results obtained by *Coffey, Berenbaum & Kerns, 2003*.

There are too few studies in this field.

They are hard to compare because of their methodological differences:

- different emotional modalities of stimuli in ES tasks
- different measures of EI

Thank you for your attention