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Daily Cognitive Experiences and Short-Term Development of Need for Cognition in Late Elementary School

Evelien Aerts, Prof. Dr. Jeroen Lavrijsen, Prof. Dr. Franzis Preckel, Prof. Dr. Karine Verschueren

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TALENT KU LEUVEN

NEED FOR COGNITION (NFC)

Individual differences in the "***tendency to seek out, engage in, and enjoy activities that require cognitive effort***"

(Cacioppo & Petty, 1982)

Related to important student outcomes

- ***Academic achievement*** (Liu & Nesbit, 2024)
- ***(Academic) well-being*** (Zerna et al., 2024)

DEVELOPMENTAL ANTECEDENTS ?

NEED FOR COGNITION (NFC)

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Individual differences in the "***tendency to seek out, engage in, and enjoy activities that require cognitive effort***"

(Cacioppo & Petty, 1982)

Cognitive Stimulation → (+) **Need for Cognition**

Observational studies have found some support (e.g., Loes & An, 2021)

BUT...

NFC only weakly associated with SES (e.g., Lavrijsen et al., 2024)

AND...

SES strongly relates to access to cognitive activities at home (e.g., Kalil et al., 2016)

Mere exposure to cognitive activities does not suffice to promote NFC in students

Students may need to “learn to love” cognitive challenge

What makes cognitive challenge rewarding?

POSITIVE COGNITIVE EXPERIENCES

Recurrent positive cognitive experiences + → Need for Cognition



Enjoyment



Perceived success



Optimal challenge

Need for Cognition

Journal of *Intelligence*

MDPI

Review

A Theoretical Framework for the Development of Need for Cognition in Childhood and Adolescence

Evelien Aerts [1,*], Jeroen Lavrijsen [1,2], Franzis Preckel [3] and Karine Verschueren [1]

1 School Psychology and Development in Context, KU Leuven, 3000 Leuven, Belgium; jeroen.lavrijsen@kuleuven.be (J.L.); karine.verschueren@kuleuven.be (K.V.)
2 Department of Mathematics, KU Leuven, 3000 Leuven, Belgium
3 Department of Psychology, Trier University, D-54286 Trier, Germany; preckel@uni-trier.de
* Correspondence: evelien.aerts@kuleuven.be

Abstract: Extensive research has highlighted the importance of Need for Cognition (NFC) in various contexts, but our understanding of its development remains limited. In particular, the current psychological literature is relatively silent regarding the factors influencing NFC development. We aim to address this gap by proposing a developmental model of NFC based on the principles of the Cognitive Adaptation Trait Theory (CATT). Through a comprehensive review of the current literature, we elucidate the potential key components contributing to the development of NFC in childhood and adolescence. Additionally, we outline several potential strategies to foster NFC development based on the key components of the model. The model aims to provide a starting point for future research on possible mechanisms underlying the development of NFC. Moving forward, future research should empirically test these hypotheses in real-world settings to enhance our understanding of NFC development and validate the suggested fostering strategies on their effectiveness.

Keywords: need for cognition; developmental model; childhood and adolescence; Cognitive adaptation trait theory (CATT)

TH!NK STUDY

Longitudinal dairy study

- 414 fourth- and fifth-grade students (51.7% boys; M_{age} = 10.04, SD_{age} = 0.68)
- Five measurement weeks spread across 15 months (Jan 2024 – Mar 2025)
- Each week, students completed an online diary for seven evenings

Engagement in and experiences with cognitively challenging activities

- Mon, Tue, Thu, Fri ⟶ cog. act. at school
- Wed, Sat, Sun ⟶ cog. act. outside of school

- NFC assessed at the end of each week



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Variable	Item/instrument	Response scale
Engagement frequency	*"How often did you really use your brain today at school / outside of school?"*	Likert scale (1 = very little, 5 = very often)
Cognitively challenging activity	*"Think about one activity during which you really had to use your brain today at school / outside of school. What were you doing?"*	Open question
Experiences with this activity **(1) Enjoyment** **(2) Perceived success** **(3) Optimal challenge**	(1) *"Did you enjoy this activity?"* (2) *"Did you feel like you could do this activity well?"* (3) *"Did you find this activity appropriately challenging?"*	Slider scale (0 = not at all, 100 = absolutely)
Need for Cognition	Need for Cognition scale for children (14 items, Preckel & Strobel, 2017)	Likert scale (1 = not at all, 5 = absolutely)

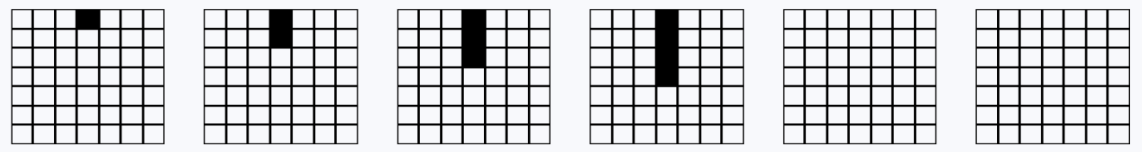
TH!NK STUDY

- Parental educational level (before W1)

  1 = no secondary education
  2 = secondary education
  3 = associate degree
  4 = college degree
  5 = university
  6 = doctorate (PhD)

- Fluid reasoning assessment with digital Pattern Sequences test for 207 students (between W1 and W2)

  Age-adjusted scores



Example item of the Pattern Sequences test



RESEARCH QUESTIONS

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1. ***Do positive cognitive experiences predict students' NFC, beyond their frequency of engagement in cognitive challenges?***
2. ***Do positive cognitive experiences predict short-term growth in NFC, beyond their frequency of engagement in cognitive challenges?***
3. ***Does fluid reasoning predict students' NFC, beyond their frequency of engagement in and experiences of cognitive challenges?***
4. ***Does fluid reasoning predict short-term growth in NFC, beyond their frequency of engagement in and experiences of cognitive challenges*?**

→ **Separately for the school and outside-of-school context**

ANALYSES

LATENT GROWTH CURVE ANALYSES

Outcome: NFC scores (M1-M5)

Predictors:

- Frequency of engagement
- Enjoyment, perceived success, and optimal challenge

  → **either at school or outside of school**

- Fluid reasoning scores

  → **only in subsample (*n* = 207)**

Control variable: parental educational level

RESULTS: Change in NFC

- Significant decline in NFC over time
- Significant variance in intercept and slope of NFC

Students differed meaningfully in their NFC levels and in how their NFC changed over time

Motivates the inclusion of predictors to explain these individual differences

RESULTS: predictors

Fluid reasoning not included

NFC level

- Enjoyment and parental education→ positive predictor in both contexts
- Perceived success → positive predictor at school
- Optimal challenge → positive predictor outside of school
- Engagement frequency → not significant in either context

Change in NFC over time

- No significant predictors in either context

Fluid reasoning included

NFC level

- Enjoyment and fluid reasoning → positive predictors in both contexts
- Engagement frequency → positive predictor outside of school
- Perceived success and optimal challenge→ not significant in either context
- Parental education → not significant in either context

Change in NFC over time

- No significant predictors in either context

SUMMARY

Cognitive experiences ⟶ Students' NFC levels

Enjoyment ~ *most robust predictor*

Perceived success in school

Optimal challenge outside of school

} *not significant when controlling for fluid reasoning*

Fluid reasoning ⟶ Students' NFC levels

~ *positive predictor above and beyond cognitive experiences*

~ *in line with investment theories*

Parental educational level ⟶ Students' NFC levels

~ *not significant when controlling for fluid reasoning*

However, none of these explained short-term changes in NFC

DIRECTIONS FOR FUTURE RESEARCH

Longer study period

Bidirectional processes

Also including global experience measures

Comprehensive measures of cognitive ability in larger samples

EDUCATIONAL IMPLICATIONS

- Assessing enjoyment alongside cognitive ability
- Fostering enjoyment across learning contexts

THANK YOU!

ECHIA
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TH!NK TEAM



EVELIEN AERTS

PhD student

evelien.aerts@kuleuven.be



PROF. DR. KARINE VERSCHUEREN

Supervisor



PROF. DR. JEROEN LAVRIJSEN

Co-supervisor



PROF. DR. FRANZIS PRECKEL

Co-supervisor