



VÝROČNÍ (PRŮBĚŽNÁ) ZPRÁVA PROJEKTU

specifického výzkumu - zakázka č. 2113

(pracoviště 01240, činnost 1210)

Vliv negativních instrukcí: eye-trackerová studie **The effect of negative instructions: eye-tracker based study**

Odpovědný řešitel:

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Stručný popis výzkumného problému

Obecný cíl: návrh a realizace experimentu, jehož účelem je prokázat přímý vliv negativních instrukcí na kognitivní procesy subjektů využitím detekce oční stopy.

Výzkumný cíl: verifikační studie - charakter stimulu (pozitivní vs. negativní instrukce) jako nezávislá proměnná a vybrané měřitelné charakteristiky kognitivní reakce jako závislá proměnná (indikátory popisující oční pohyby, latence odpovědi a správnost reakce/odpovědi).

Stručný popis postupu řešení

- 1) Byla nastudována problematika vedení, realizace a zpracování eye-trackerových studií
- 2) Byl vytvořen metodický koncept plánovaného experimentu (pravidla)
- 3) Byl zajištěn a upraven podnětový materiál, který byl vložen do programu pro ET vizuální studii.
- 4) Byla ověřena funkčnost a plynulost expozice a snímání dat (tři subjekty – experimentátorka a dva dobrovolníci).
- 5) Byl realizován experiment na souboru N=20.
- 6) Byla získána, utříděna a vyhodnocena data.
- 7) Výsledné údaje byly popsány, vyhodnoceny a byly nastudovány materiály pro jejich diskusi.
- 8) Byla vytvořena a přeložena ppt prezentace na světovou konferenci ICL.
- 9) Byla realizována prezentace na plánované konferenci ICL (prezentoval student).
- 10) Výsledky byly zpracovány do publikačního výstupu pro časopis The International Journal of Pedagogy and Curriculum, přeloženy do A+ english a postoupeny pro recenzní řízení (viz publikační výstupy).
- 11) Byl revidován stav čerpání, požádáno o změnu struktury rozpočtu, řádně dočerpáno a čerpání zpracováno do závěrečné zprávy.
- 12) Byla vypracována a odeslána závěrečná zpráva.

Splnění kontrolovatelných výsledků řešení

Výsledky výzkumu byly prezentovány na 22nd International Conference on Learning (9. – 11. 7. 2015, Madrid, Španělsko), na místě prezentoval student. Výsledky byly dále rozpracovány do výzkumné studie pro časopis The International Journal of Pedagogy and





Curriculum zařazený do databáze Scopus - článek již úspěšně prošel recenzním řízením (oba recenzenti akceptovali v prvním kole) a aktuálně je ve stadiu „ready for typesetting“. Výstup je zadaný v OBD pod ID 43870966 jako rozpracovaný s vazbou na RIV.

Nad rámec původně plánované publicity byl projekt a jeho výsledky prezentovány na semináři konaném na UHK pod záštitou CEPEV (seminář zaměřený na příklady dobré praxe zapojení studentů do výzkumných projektů) a série projektů SV realizovaných za poslední 4 roky pod vedením Dr. Havigerové zaměřených na fenomén lexikální negace a větneho záporu byla prezentována na semináři pořádaném Jazykovědným sdružením na UHK.

Výstupy

HAVIGEROVÁ, J. M., & NOVOTNÝ R. (2016, in print). When told “Don’t look there“: eye-tracker based study. *The International Journal of Pedagogy and Curriculum*, ????. ISSN 2327-7963.

Přehled realizovaných výdajů

Název kategorie	Uskutečněné výdaje (čerpano)	Plánované výdaje (žádáno)	Konkretizace
DPP pro studenta (Mgr. Novotný)	8000	8 000	8 000 DPP student
Odměna řešitelce (Dr. Havigerová)	3 537,59	4 000	2 640 odměna 237,59 pojištění zdr. 660 pojištění soc.
Služby – překlad	7 928	8 000	7 928 překladatelské služby
Cestovné a platby na konferenci (Mgr. Novotný)	31 989,80	43 000	9 351,80 konf. poplatků 7 483 letenka Madrid 14 935 cestovní náklady 220 cest. pojištění
Materiální náklady	24 379	13 500 (po navýšení)	Tonery, papíry, odměny pro respondenty
Jiné	666,60	0	199,88 kurzové ztráty 466,22 bankovní poplatky, 0,50 haléřové vyrovnání
Celkem	76 500,99 CZK	76 500 CZK	

Celkem realizované výdaje **76 500,99 CZK**

Seznam příloh

Příloha č. 1 - Příspěvek pro *The International Journal of Pedagogy and Curriculum*.

Vyúčtování

Příloha č. 2 – Výsledovka po účtech obrátová - výpis z Magionu (pracoviště 01240, zakázka 2113, činnost 1210, k 10.12.2015)

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Dne 13. prosince 2015

Podpis



Příloha č. 1 – Article

When told “Don’t look there“: eye-tracker based study

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Abstract: The way we formulate instructions to pupils often fundamentally affects their reactions. The purpose of the study is to describe the effect of negativity of the instruction on observable manifestations of eye-track of its recipient. Respondents (N=20) were exposed to a set of visual stimuli (different sets of 4 images), which in turn was preceded by command instruction "Look at .." or prohibition instruction "Do not look at ..." one of the images. Then two control questions followed, which were related to the presented stimuli. Three research questions were formulated: 1. Is there any difference in the observed variables when a positively and a negatively formulated instruction is read? 2. Can a prohibition be fully respected and the "prohibited zone" not looked into? 3. Will the instruction valence (positive, negative) affect the success rate of answers to subsequent control questions? Based on the results of our research, it can be concluded that: 1. There is no significance difference in the eye track when reading positive (command) and negative (prohibition) instruction. 2. It is almost impossible to be fully respect neither command nor prohibition (both were demonstrably violated in 88.12 %), and it is easier to violate a command. 3. Type of instruction (positive/command, negative/prohibition) doesn't have significant impact on success in the subsequent attention test. Research has shown that negative instructions have at least so called paradoxical effect, therefore, we affirm that it is appropriate to try to avoid this type of instructions and speak positively.

Keywords: Negativity, Instruction, Eye tracker, Paradoxical effect

Introduction

Education is the process of teaching, training and learning especially in the educational institution to improve knowledge and develop skills (Ahmad, 2008: 172). Teaching is not merely a process of acting, but “*much beyond this, they interact*” (Veal, & Anderson, 2010: 73). Interaction between the teacher and the pupil seems most important (Poetter, & Badiali, 2001). In these interactions, communication has the prime position, naturally. In the context of the means of communication, this paper is focused on verbal communication from the teacher (communicator) towards the pupil (communicant). A significant share of the communication is represented by instructing (Mottet, Richmond, & McCroskey, 2006). Instructions are communicated verbally, using language. Language plays a crucial role in the communication of instructions. It has been confirmed repeatedly what a significant role may be played by even the subtlest changes in the language means used, and how such changes may be reflected in various areas of the “*psychosocial space*“ of the recipient (Rosenberg, 2014).

The phenomenon of negation (i.e. the use of negative verbs, verbal negation, sentential negation, interdiction) is one of relatively little studied fields in this respect – for example, the database Web of Knowledge contains only 1831, and the database Scopus only 950 papers whose text includes the word “*negative*“ and either “*instruction*“ or “*wording*“, and the combination with “*negation*“ is found only in 56 papers in WoS and in 7 in Scopus. However, this phenomenon is extremely interesting and not unimportant in the pedagogical process.

Negation

In linguistics, negation can be defined as “*a morphosyntactic operation in which a lexical item denies or inverts the meaning of another lexical item or construction*” (Loos, Anderson, Day, Jordan, & Wingate, 2004). The phenomenon of negation appears very early in the development of man; rich documentation of this phenomenon is available for the first two years of life of an individual, already in the single-word utterance period (Pea, 1980), and it can be even observed in the prespeech period and in animals (ibid.). As a rule, three forms are distinguished in speech: nonexistence, rejection and denial (Cuccio, 2012).

Negation is a central feature of language and cognition, interacting with all areas of grammar as well as with the philosophy of language and as Horn and Katō (2000) point out, whereas there is a cross-linguistic uniformity in logical and semantic aspects of negation, there is a diversity of syntactic and morphological forms and rules. Negation in discourse can be specified as “*a cognitive or conceptual space*” (Hidalgo-Downing, 2000: 147) and from discourse perspective it perform two basic functions: 1. a function of up-dating information in the text worlds by means of modifying information in the text world, either world-building elements or function-advancing propositions, 2. a function whereby an item is both presented and denied at the same time (ibid.).

Precisely the second function may also be related to the psychological phenomenon of negation in the sense of a defense mechanism as described already by Sigmund Freud (1925, as cited in Danon-Boileau, 2005): the term negation (Verneinung) denotes a mental process in which the subject formulates the content of an unconscious wish in a negative form. Freud posits two distinct processes of negation: one involves the rejection of a thought, the other the acknowledgment of a disappointed expectation. For example, when a client has had a dream of a woman, describing the dream to the analyst he says: “*The woman was not my mother*“, because a patient refuses to believe that the woman he has just dreamed about is his mother - such negation may be



interpreted to mean, "I reject the idea that this person could be my mother because I dislike that idea." Negation is a rejection of an unpleasant idea by means of the pleasure principle alone.

The above mentioned negative emotions (an unpleasant idea) are often tightly connected to the phenomenon of negation also on a more general level. As regards the observed negative imperatives, directly the so called negative **imperative mood** or **prohibitive mood** can be found in specialized literature (for example, Palmer, 2001).

The defensive mechanism of negation comes from within – various contents emerge in our mind, which we reject, and the process ends with externally formulated thoughts as negative sentences. However, this process can be described in the opposite direction, as well. When our psyche is exposed to external negative sentences, it reacts with an increased production of these contents in the mind. A very elegant demonstration of this phenomenon has been presented by Daniel Merton Wegner in his study on white bears: the respondents' task was to keep describing for 5 minutes what was going on in their minds. Before they began, one group was instructed: "Don't think about the white bear during the test". The white bear appeared at least once per minute in subsequent verbalizations. When the same group were to do the same task and was instructed: "Think about the white bear this time", the white bear was present in the verbalized stream of consciousness much more frequently than in the control group that received this positive instruction straightaway. Based on this (1987) and a number of other studies, Wegner formulated his **theory of ironic processes**, which says that as soon as our mind is forbidden something, one part of it seeks to avoid the forbidden and the other assumes the position of a controller and on the contrary, it concentrates on the forbidden to ensure that the unwanted thought is prevented, paradoxically bringing the thought to the mind. Analogical conclusions were reached by McCombs and Shaw in a no less famous study of voting preferences based on which they postulated the **agenda-setting theory** (McCombs, 2005). The same effect has been known primarily from medicine as the **paradoxical effect** (for example, Mancuso, Tanzi, & Gabay, 2004), and has also been well documented with respect to negative instructions and prohibitions (for example, Maciuszek, 2013). An Internet-based marketer, Michal Krčmář (2011) formulated this phenomenon from the practical point of view: "A prohibition evokes curiosity; a desire that increases with time. In the end, many individuals do not resist this urge anyway and yield to it. (...) Negations and prohibitions can be successfully used also in business. A suitably chosen negation can help you to increase the click-through rate in links from articles or Facebook statuses, or to increase the sales of selected products (...). As a rule, any text that includes negation can always be expected to provide a higher response rate."

The author of this study has been engaged, in a rather long term, in this linguistic phenomenon of negation (focused on negative imperatives) in the pedagogical practice. In her previous studies, she found out among other things that negative verbs were a frequented part of the active vocabulary of teachers (of 792,764 words expressed during 204 analyzed teaching hours, the teachers used 9,361 negatively formulated verbs; of these, 409 took the form of an imperative, i.e. a prohibition, see Havigerová, & Karásková, 2012), that certain situations cause the educators and subsequently children to increased need to use lexical negation in their verbal expressions: first, the situations in which pupils behaviour is beyond the rules, second, the situations where the teacher draws attention to the pupil's error or mistake and third, the situations that requires a quick solution (Havigerová, Křováčková, Karásková, Krupičková, & Vítová, 2014) and that young students have in their active vocabulary higher proportion of negative verbs if they are induced by negatively formulated teacher's instructions (15% of all words), compared with students who were induced positively (9%) and that type of instruction influences cognitive processes and performance: positive induction lead to increase production of the text (1488 words used), while the negative induction led to inhibition of production (only 883 words used) (Havigerová, Loudová, Novotný, & Krupičková, 2015).

In this study, we focused on the phenomenon of "**negative commands**" (for example, Adler, 1980); we wanted to find out what happens when an individual receives a negative instruction, for example, when the teacher or parent says: "Don't look there". We used the visual tracking technology to observe the reaction; this technology can possibly be useful for receiving vital information about non-verbal and implicit reactions.

Method

Purpose of study

The purpose of the study was to describe the effect of negativity of the instruction on observable manifestations of its recipient. For the purpose of the study, such observable manifestations were operationalized as eye movements and as the focus of the eyes; observed variables are described in the section Data. We formulated the following research questions:

- 1) Is there any difference in the observed variables when a positively and a negatively formulated instruction is read?
- 2) Can a prohibition be fully respected and the "prohibited zone" not looked into?

- 3) Will the instruction valence (positive, negative) affect the success rate of answers to subsequent control questions?

Material

The research data was obtained using TOBII X2-60. This instrument can be used to track the movements of the human eye. The instrument operates on the principle of two video cameras that scan eye movements and register and visualize the eye track record (fixations and saccades) in the observed visual material (a computer-based presentation in our case).

The stimulating material, designed as a computer-based presentation, contained an initial instruction (“A set of seemingly simple tasks will follow, which are focused on sharp observation and peripheral vision. PLEASE, FOLLOW THE INSTRUCTIONS LITERALLY! Continue by pressing the spacebar.”) and a series of 8 test tasks. The principle of the tasks was the same in each case:

1. An instruction was displayed at first (with the exposure time of 5 seconds), while positive and negative variants of its formulation alternated; positive instructions always began with the words: “Look at ...“ (tasks 1, 3, 6 and 8), and negative instructions always began with: “Don’t look at ...“ (tasks 2, 4, 5 and 7);
2. Subsequently, a picture was displayed containing four visual stimuli (the exposure time was 10 seconds in each case; simple geometric shapes were used for tasks 1 and 5, large block letters for tasks 2 and 6, drawn animals for tasks 3 and 7, and photographs of the human face and upper part of the body for tasks 4 and 8); the stimuli were not repeated in order to prevent the effect of learning;
3. Then two control questions followed, which were related to the presented stimuli; one positive (for example: “What was the colour of the letter M“) and one negative (“Which of the letters was not present in the picture: A, F, M, P?“) were alternated in a random order; three possible answers were always offered, where only one was correct; as soon as the respondent identified their answer, the presentation continued with the next step.

The test was ended by a “Thank you” screen.

The computer used the eye-tracker to record both the eye track on the screen and the respondent, thus the research material is available not only as a set of numeric data of the eye track, but also as a synchronized video record that visualizes the eye track over the presented stimulating material with a record of the respondent located in the upper left corner of this video material (see Figure 1).



[1] Figure 1 Record of the respondent and her eye track over the stimulating material

Source: Author’s Archive

First of all, the program was tested by the authors to verify a smooth and problem-free running of the program and of the instrument. Subsequently, two random volunteers were addressed with no prior awareness of the experiment that could influence their reactions. These volunteers completed the entire procedure with a subsequent focused interview. The timing was adjusted based on the reactions and comments of the testers. The thus adapted program was used for the research itself. Neither the authors nor the testers were included in the research set, and their data was deleted.

Procedure



The research was implemented as a laboratory experiment. The experiment was done in the office of the main author, where the notebook was placed together with the connected mobile eye-tracking instrument. The video camera of the instrument was located under the screen, fixed using a special clip. Always one participant and the research assistant were present in the room during the research. First, the assistant told the participant that he or she would take part in a research focused particularly on peripheral attention, and the assistant asked the participant to express their consent to voluntarily participate, and to the use of all obtained data for implementation and presentation of the research results. Subsequently, the instrument was calibrated for the specific user – the user sat down in front of the computer with the instrument and was looking at the screen where he or she was observing a moving point as instructed. The instrument automatically evaluated the ideal distance of the eyes, accuracy and gaze precision. Then the program itself was run and the course of the experiment was recorded. Finally, we thanked every student and said goodbye.

Participants

Twenty people took part in the experiment, all white women of the Czech nationality, all students of the Faculty of Education at the University of Hradec Králové, Czech Republic (N=20; mean age $M = 20.47$; $SD = 1.29$). Students present near our provisional laboratory on 15 March 2015 were addressed; all addressed students agreed to participate immediately (the so called purpose sampling). Participation in the experiment was voluntary and unpaid.

Results

Data

All available types of the obtained data will be used to describe the results.

The eye-tracker can be used to monitor a number of variables. The following abbreviations will be used in further text for their descriptions:

- TFF = time to first fixation – it is a measure of how many milliseconds it took a participant to first fixate on a particular area of interest (AOI),
- FFD = first fixation duration – is the length of time in milliseconds that the participant fixated on an AOI during the first fixation,
- FD = fixation duration - is the length of time in milliseconds that the participant fixated on an AOI during each fixation (mean is calculated),
- TFD = total fixation duration - is the total time in milliseconds that the participant fixated on an AOI during the all fixations,
- FC = fixation count – is the number of times the participant fixated on an AOI,
- VD = visit duration – is the total time in milliseconds that the participant looked at a particular AOI.

In this explorative study, we will look at selected variables and compare their values depending on the type of the initial instruction. Two types of instruction are recognized: a **positive instruction** (the command “Look at ...”), or a **negative instruction** (the prohibition “Don’t look at ...”). Each instruction had its own slide, which was exposed for 5 seconds.

Furthermore, the eye track will be monitored over individual visual stimuli, regularly arranged, always four stimuli in one screen, exposed always for 10 seconds. We will separately describe the so called **allowed zone**, i.e. in the event of the positive instruction (for example: “Look at the letter M”), a set area is concerned (the quadrant in which the letter M is found); in the event of the negative instruction (for example: “Don’t look at the letter H”), an area outside the set one is concerned, thus the area containing the other three objects in the three remaining quadrants. We will describe separately the so called **prohibited area**, i.e. in the event of the positive instruction (for example: “Look at the monkey”), the part of the picture outside the area of interest will be monitored (thus the area with the other three exposed animals); in the case of the negative instruction (for example: “Don’t look at the tiger”) we will monitor precisely the area in which the object (tiger) is found.

The results are presented in accordance with the three study questions identified.

What is the difference in the eye track when the instruction is read depending on its type (a command or a prohibition)?



The first part of the analyses observes selected characteristics of the eye track when the instruction is read, and two types of instructions are compared: positive (the command “Look at ...”), and negative (prohibition; “Don’t look at ...”). Descriptive characteristics are shown in Table 1.

[2] Table 1 Characteristics of eye track on instruction: descriptive statistics (N=20)

<i>Type of instruction</i>	<i>Mean TFF</i>	<i>Mean FFD</i>	<i>Mean FC</i>	<i>Mean TFD</i>
POSITIVE (symbols)	0,387±0,213	0,219±0,050	9,474±4,005	2,905±1,212
NEGATIVE (symbols)	0,789±1,109	0,229±0,100	10,211±4,467	3,361±1,430
POSITIVE (letters)	0,284±0,126	0,204±0,067	12,550±2,544	3,783±0,770
NEGATIVE (letters)	0,424±0,566	0,227±0,073	11,300±4,281	3,474±1,066
POSITIVE (animals)	0,496±0,811	0,220±0,145	9,550±3,818	3,100±1,434
NEGATIVE (animals)	0,355±0,202	0,267±0,158	9,650±3,281	3,339±1,145
POSITIVE (faces)	0,623±0,825	0,219±0,116	10,600±4,903	2,795±1,258
NEGATIVE (faces)	0,334±0,198	0,206±0,097	11,500±4,371	2,981±1,155

Visual inspection of the data may show some minor differences between the two types of instruction. In order to evaluate the importance of these differences, the paired samples t-test was calculated whose results enable us to note that the differences between the couples of instruction are not statistically significant. Analogical results were obtained by calculations focused only on the verb in the instruction; no demonstrable difference was shown between the positively and negatively formulated instructions, either.

Is it possible to fully observe the command or prohibition and not look at the “prohibited zone“?

The second part of the analyses is focused on the area of the so called prohibited zone while in connection to the positive instruction, the command is violated upon looking at the prohibited zone, and analogically, in connection to the negative instruction, the prohibition is violated upon looking at the prohibited zone. Descriptive statistics data for the FC (fixation count) characteristic of the eye track in the prohibited zone is shown in Table 2.

[3] Table 2 Characteristic FC of eye track on restricted area: descriptive statistics (N=20)

<i>Type of instruction</i>	<i>Mean</i>	<i>Mean á object*</i>	<i>Median</i>	<i>SD</i>	<i>Variance</i>	<i>Range</i>	<i>Min</i>	<i>Max</i>
POSITIVE (symbols)	9,85	3,28	5,00	10,26	105,29	36	1	37
NEGATIVE (symbols)	2,60	2,60	2,00	1,51	2,27	4	1	5
POSITIVE (letters)	6,35	2,12	3,50	7,26	52,66	22	1	23
NEGATIVE (letters)	2,80	2,80	2,00	2,65	7,03	9	1	10
POSITIVE (animals)	14,35	4,78	11,50	8,41	70,77	31	4	35
NEGATIVE (animals)	2,59	2,59	2,00	1,58	2,51	5	1	6
POSITIVE (faces)	17,75	5,92	17,00	5,68	32,30	23	5	28
NEGATIVE (faces)	2,25	2,25	2,00	1,33	1,78	4	1	5

*The variable Mean á object = M/3 was established in order to filter out any effect of different sizes of the prohibited zones (given that 3 objects are found in the prohibited zone in connection to the positive instruction, while the prohibited zone connected to the negative instruction contains only 1 object).

The minimum count of fixations in the prohibited zone as a whole ranges from 1 to 5, which indicates that the eye movement was fixated always at least once in each of the eight exposures displayed to the respondent. This value may lead us to conclude that neither the command nor the prohibition can be observed. However, in fact, the logic of the problem requires a value higher than 1 to determine that a command or prohibition has been violated (for example, when it is prohibited to look at the tiger, one must find out at first where the tiger is in order to effectively avoid looking at the tiger subsequently). Table 3 therefore shows the number of respondents who fixated their eye in the prohibited zone only once.

[4] Table 3 Characteristic FC of eye track on restricted area: descriptive statistics (N=20)

<i>Type of instruction</i>	<i>Number of respondents with FC = 1</i>
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<i>POSITIVE (symbols)</i>	1
<i>NEGATIVE (symbols)</i>	3
<i>POSITIVE (letters)</i>	3
<i>NEGATIVE (letters)</i>	7
<i>POSITIVE (animals)</i>	0
<i>NEGATIVE (animals)</i>	5
<i>POSITIVE (faces)</i>	0
<i>NEGATIVE (faces)</i>	0

As follows from the values, the respondents fixated their eye in the prohibited zone only once in 19 of 160 exposures, i.e. no demonstrable violation of the command or prohibition occurred in 11.88%. The command or prohibition was demonstrably violated in 88.12% given that the respondent fixated their eye in the prohibited area more than once.

What is easier – to violate a command or prohibition?

Knowing that a command or prohibition is demonstrably violated in a vast majority of cases (88.12%), we can ask a new question: what is easier, to violate a command or a prohibition?

When we visually inspect the data in Table 3 above, we could be tempted to assume that violating a command is easier than a prohibition: the command (the positive instruction “*Look at ...*”) is clearly violated more frequently as indicated by higher mean, median, variance, range, and maximum values. The *positive instruction for letters* (“*Look at the letter M*”) is the only exception where the mean count of fixations on the letter in the prohibited zone in the column *mean á object* is lower than the mean count of fixations on the letter prohibited by the negative instruction. To be able to provide a plausible answer, the paired samples t-test was calculated. Considering the small sample and non-normal distribution of the data, the non-parametric Related Samples Wilcoxon Signed Rank Test was also calculated, which provided almost identical results. The results are shown in Table 4.

[5] Table 4 Characteristics of eye track on restricted area: paired samples t-test (N=20)

<i>Paired Samples Test</i>	<i>POSITIVE – NEGATIVE (restricted area)</i>	<i>Paired Differences Mean</i>	<i>SD</i>	<i>t</i>	<i>df</i>	<i>Sig. (2-tailed)</i>	<i>Wilcoxon SRT (Sig.)</i>
<i>TFF</i>	<i>symbols</i>	-0,260	0,198	-4,155	9	0,002	0,000
	<i>letters</i>	-0,403	0,390	-4,001	14	0,001	0,001
	<i>animals</i>	-0,389	0,403	-3,978	16	0,001	0,001
	<i>faces</i>	-1,264	1,549	-3,647	19	0,002	0,000
<i>FC</i>	<i>symbols</i>	8,400	10,124	2,624	9	0,028	0,017
	<i>letters</i>	3,600	4,867	2,865	14	0,012	0,003
	<i>animals</i>	13,000	7,665	6,993	16	0,000	0,000
	<i>faces</i>	15,500	5,287	13,112	19	0,000	0,000
<i>TFD</i>	<i>symbols</i>	1,242	4,322	0,909	9	0,387	0,015
	<i>letters</i>	0,519	3,130	0,643	14	0,531	0,061
	<i>animals</i>	3,482	2,284	6,286	16	0,000	0,000
	<i>faces</i>	8,293	1,003	36,992	19	0,000	0,000
<i>VD</i>	<i>symbols</i>	1,394	4,502	0,979	9	0,353	0,093
	<i>letters</i>	0,558	3,159	0,684	14	0,505	0,061
	<i>animals</i>	3,601	2,331	6,370	16	0,000	0,000
	<i>faces</i>	8,580	0,854	44,942	19	0,000	0,000

As indicated by the results in Table 4, differences in the observed values are always in favour of violation of the command: TFF – the first fixation occurs earlier; FC – fixation in the prohibited zone occurs more frequently; TFD – the total duration of eye fixation in the prohibited zone is longer; VD – the total duration of looking at the prohibited zone is longer. In 12 of 16 measurements, the resulting difference between the mean values is statistically demonstrable, especially for more complex stimuli (animals – drawn animal figures, and faces – photographs of human faces).



Does the type of the initial instruction (command or prohibition) affect the success rate in the subsequent “attention” test?

Two questions always followed after exposure to the visual stimulus (symbols, letters, drawn animals or photographs of persons); one question was formulated positively (for example, *What was the colour of the symbol plus?*) and one negatively (for example, *Which of the symbols was not displayed in the picture: a triangle, square, or circle?*). Given that the experiment was presented as a research of peripheral vision, the questions always concerned a part of the exposed stimulus that was to be found outside the field of vision of the

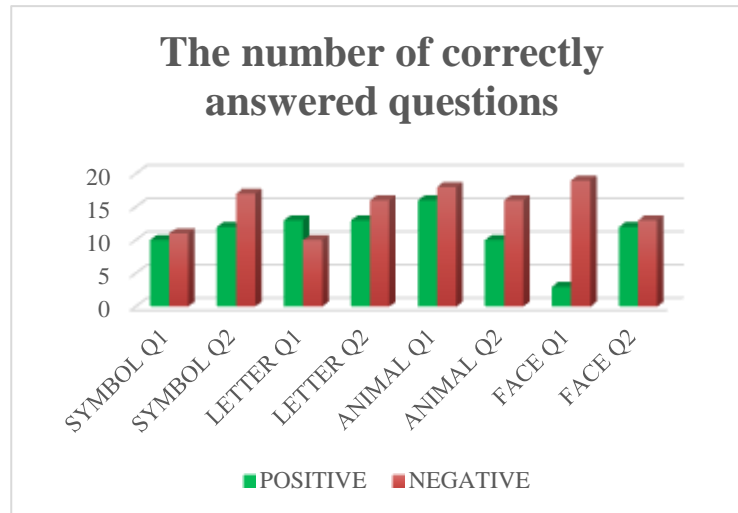


Figure 2 The sum of correct answers

respondent according to the instruction (for example, when the instruction read “*Don’t look at the tiger*“, the question concerned the tiger; on the contrary, when the instruction read “*Look at the man in the blue shirt*“, the question concerned the lady with a necklace). The total number of correct answers was observed. Figure 2 shows the sum of correct answers while the maximum of possible correct answers is 20. For better clarity, results related to the positive instruction before exposure to the stimulus (“*Look at ...*“) are marked in green (left columns), and results related to the negative instruction before exposure (“*Don’t look at ...*“) are marked in red (right columns).

According to Figure 2, it seems that the number of correct answers predominates in questions asked in connection to the negative instruction (red columns). This hypothesis was verified using the paired samples test method for the sum of correct answers to individual questions. The results are described in Table 5.

[6] Table 5 Success rate in the test: Paired Samples Test (N=20 respondents, á 16 questions)

<i>Paired Differences</i>	<i>Mean</i>	<i>SD</i>	<i>t</i>	<i>df</i>	<i>Sig. (2-tailed)</i>
positive - negative	-3,875	5,617	-1,951	7	,092

Conclusion: The difference in the success rate in the attention test is not related to the type of the initial instruction (a command or a prohibition).

Discussion

Is there any difference in the observed variables when a positively and a negatively formulated instruction is read? The present knowledge leads us to conclude that the brain processes negative, neutral and positive words differently (Oliviera et al., 2011). As concluded by classical studies, the processing of negative words / sentences takes longer because (among others) the reading time is longer in the negative than in affirmative condition (Benz, Kühnlein, 2008). At the same time, the negative sentences are particularly felicitous in contexts in which the proposition that is being negated was either explicitly mentioned or at least constitutes a highly plausible assumption (Lüdtke, Kaup, 2006). The longer processing time and/or different processing of negative sentences may also be related to a lower frequency of their occurrence in natural speech (Tottie, 1991).

The eye-tracking method is ideal for measuring word recognition in reading (Sereno & Rayner, 2003). The verb was always shown in the left part of the screen, thus the effect of the visual field should be eliminated (Mneimne, Powers, Walton, et al., 2010). We thus expected that reading of the negative instruction would leave a different eye track in the observed variables than reading of the positive instruction. However, as follows from our results, there is no difference between the eye track when a positively (a command) and a negatively (a prohibition) formulated instruction is read. The interpretation of this result can be supported by two facts. Firstly,



both instructions were of approximately the same length (in Czech, the length differs only by two letters). Secondly, the instruction was exposed for the same time, namely 5 seconds in every case. In subsequent experiments, we would like to use a scheme with an open duration of exposure – the exposure of the instruction would be terminated by the respondent by clicking the mouse when they feel that they have read and understood the instruction. Also, the effect of expectation and the effect of learning cannot be omitted (only two forms of the basis of the instruction were used – “*Look at*“ and “*Don’t look at*“), which may have affected the eye track, thereby suppressing any other, otherwise natural manifestations (Staab, 2008).

Can a command or a prohibition be fully observed? Generally speaking, in both cases a role is played by the willingness to observe the instruction (a command or a prohibition). The obtained results can be thus evaluated in terms of the **theory of obedience**. In the context of the famous Milgram experiment (Milgram, 1963), we can expect that most respondents would seek to respect the instruction and to observe the command or prohibition, while their intentional violation is unlikely. Any violation thus does not mean a lack of discipline in the sense of intentional violation of the rules, but it is rather a manifestation of unconscious mechanisms of the human psyche. We expected that the negative instruction would not be observed in 100%, and that the respondent would always look into the “prohibited zone“, as demonstrated by previous studies that describe the **paradoxical effect** of negated commands (see the introduction). As indicated by the values, the respondents fixated their eye in the prohibited zone only once in 19 of 160 exposures, i.e. no demonstrable violation of the command or prohibition occurred in 11.88%. The command or prohibition was demonstrably violated in 88.12% given that the respondent fixated their eye in the prohibited area more than once.

The interpretation could be easily related to some attention phenomena such as the phenomenon of distractability: “*the shift in focused attention by any irrelevant stimuli present along with the task needing focused attention*” (Mukundan, 2007). Looking into the prohibited zone is not a classical disturbance of attention control (Eysenck, 2013), and it is not a manifestation of a deficit in focused attention or an inability to focus attention (Semrud-Clikeman & Teeter Ellison, 2009), either. In principle, we can even assume that in our experiment, the prohibited zone is not a classical distractor, but rather in the sense of the popular saying “*Forbidden fruit is the sweetest*”, which is interpreted as: “*things that you must not have or do are always most desirable (...) phrase alludes to the fruit of the tree of the knowledge of good and evil in the Garden of Eden*” (Manser, Fergusson & Pickering, 2007: 93), at the moment it is prohibited, it actually becomes an attractor (Bergstrom & Schall, 2014). This has been rather confirmed by our results, in accordance with a number of other studies focused on the effect of prohibition on human behaviour such as the study of consumer behaviour of the authors Jansen, Mulken and Jansen (2007) who demonstrated that prohibition of snacks leads to their relatively higher consumption. The interpretation could be supported by the **reactance theory** (J.W. Brehm, 1966; S.S. Brehm & Brehm, 1981, as cited in Myrseth, Fishbach, & Trope, 2009) and by the **commodity theory** (Brock, 1968) posit that decreasing availability of a stimulus increases its perceived value. According to reactance theory, this forbidden-fruit effect would operate as a function of the individual's negative reaction to constraints on the individual's freedom. According to commodity theory, the effect is driven by the scarcity principle for appraising value, the scarcer an object is, the more value it has.

What is easier to violate, a command or a prohibition? The results of our study make us to conclude that violating a command is easier (TFF – the first fixation occurs earlier; FC – fixation in the prohibited zone occurs more frequently; TFD – the total duration of fixated eye position in the prohibited zone is longer; VD – the total duration of looking at the prohibited zone is longer). In 12 of 16 measurements, the resulting difference between the mean values is statistically demonstrable, especially for more complex stimuli (animals – drawn animal figures, and faces – photographs of human faces). This is somewhat at variance with our expectations (see the introduction). The interpretation can be apparently supported by the fact that a command to observe certain stimuli means no strict prohibition to observe other stimuli. In principle, the reaction to violation of the command thus does not activate the control feedback – watch out, you are doing something wrong. The command determines the direction of attention (“*Look at the tiger*“); however, this does not necessarily mean that any diversion of attention is something prohibited (nothing was said about looking at the monkey). Somewhere back in the mind, a role may be played by the alibistic “*Whatever is not prohibited is permitted*“. Either way, the prohibition is more unambiguous in this respect – it clearly postulates the borders of what is forbidden to do.

Other psychosocial mechanisms set in in a situation where an explicitly expressed prohibition is violated, while when a command is violated, it is especially a manifestation of a situation-conditioned lower degree of self-regulation (Walcher & Peters, 2013).

No difference in the success rate in connection to the positive and negative attention-related instruction was found based on comparison of the success rate in control questions. In all cases, the questions were focused on peripheral vision (*in the sense of the ability to register the background when the attention is focused on the figure, not on covert attention that means the focusing of attention to the extrafoveal or peripheral areas of the visual field without moving the eyes or the head*, Friedenber, 2012: 69). No difference was noted in our study: the success rate in the attention test is not related to the type of the initial instruction (a command or a



prohibition). Among others, the result may be influenced by the fact that all respondents looked into the prohibited zone at least once.

Limits of study

Before the conclusions, some limits of the presented study should be mentioned. Primarily, it is the research sample. The sample was obtained using the purposive sampling method, which, although admissible, entails certain limitations particularly with respect to representativeness of the sample and thus also to generalizability of the results (for example, De Leeuw, Hox & Dillman, 2008). Furthermore, the research sample includes only females. This was not a purpose – however, given that the study was implemented at the Faculty of Education, and considering the feminization of the education system (both in central Europe, for example, Rao, 2003, and worldwide, for example, Lageman, 2000), the predominance of women in the research sample is a side effect that can be expected. Although we assume that the results would not be considerably different with uniform representation of men and women, at the moment we have no data available that could demonstrably prove or disprove this assumption. As indicated by other studies, there is no evidence for gender differences in reading skills at all (Sternberg, 2009). However, it is our aim to overcome this disadvantage in related future studies and to include a representative sample of healthy adult women as well as men in the research. Secondly, the study is limited by the nature of the research material. A certain limitation is related to the visual stimuli. We properly set the different complexity rate of the stimuli from the simplest ones (simple symbols) to more complex ones (photographs of human faces); each type of the stimulus was displayed twice and no object was repeated. However, the different number of objects in the prohibited zone can be viewed as a deficiency – 3 distractors were present in command violations, while in the case of prohibition violations, the prohibited zone included only one object. This handicap is eliminated in related studies by systematic distribution of the stimuli, i.e. 1x1 or 2x2, respectively (a higher count of elements did not prove to be good in previous experiments). Finally, the last limitation of the present study may be the fact that no mass testing of how demanding the test questions are was done in pre-research; only two independent respondents answered the questions in the pre-research phase and they commented only shortly on their complexity, while the comments of both can be summarized as follows: the more complex the visual stimuli were, the more demanding the questions to subsequent stimuli seemed. However, the results of the experiment itself showed a dramatic lack of success in question Q15 (Where in the picture was the woman in the red dress? where only 3 of 20 respondents answered correctly) – its difficulty was apparently significantly higher than that of the other questions. Subsequent experiments will be therefore preceded by a more extended pre-research, for which a larger set of questions will be proposed, and only questions with a medium level of difficulty will be used for the experiment. Keeping these limitations in mind, let us look at the results and at what they could mean for the education process.

Implications for teachers

Communication at school runs in the verbal mode to a considerable extent. As a rule, the communication is controlled by the teacher. Even the finest nuances may alter the meaning and influence the behaviour of the recipient of such communication. Negative sentences are a common part of the vocabulary of teachers, for example, in tests (“Which of the following options is not a fruit”), when regulating the behaviour of the pupils (“don’t shout out“, “don’t rock on the chair“), and in a number of other contexts. In the submitted study, we focused precisely on negative commands. However, as we have shown, these negative imperatives may have a counter-productive effect. On one hand, they attract undesirable attention to prohibited phenomena and may set these phenomena in the pupils’ minds – they may not have come to their minds at all without expressing the prohibition (for example, when the pupils are warned “Don’t look in your neighbour’s papers“ during a test, someone who has not had an idea of obtaining the result by its copying from their neighbour at all may start to think that there is also another way how to achieve the correct result besides relying on their own resources). The content of negative commands even becomes an attractor (see the phenomenon of prohibited fruits – at the moment we are prohibited to copy from another pupil, copying apparently becomes significantly more attractive than before explicitly formulating the prohibition of copying), and a more intensive self-regulatory mechanism will have to be developed for an individual to resist the urge to violate the prohibition.

Pedagogical recommendations may be adopted from Wegner’s recommendations as cited by Winerman (2011):

1. Pick an absorbing distractor and focus on that instead: In one study, Wegner and his colleagues asked participants to think of a red Volkswagen instead of a white bear. They found that giving the participants something else to focus on helped them to avoid the unwanted white bears.
2. Try to postpone the thought: Some research has found that asking people to simply set aside half an hour a day for worrying allows them to avoid worrying during the rest of their day, Wegner said. So next time an unwanted thought comes up, he suggested, just try to tell yourself, “I’m not going to think about that until next Wednesday.”



3. Cut back on multitasking: One study found that people under increased mental load show an increase in the availability of thoughts of death—one of the great unwanted thoughts for most people.
4. Exposure: “*This is painful,*” Wegner said, “*but it can work.*” If you allow yourself to think in controlled ways of the thing that you want to avoid, then it will be less likely to pop back into your thoughts at other times.
5. Meditation and mindfulness: There's evidence that these practices, which strengthen mental control, may help people avoid unwanted thoughts, Wegner said.

The last recommendation for the pedagogical practice can be derived from the “*third side of the coin*“. In our opinion, directivity of the teacher should be (taking into account the current state of mental development of the pupil) restricted to a necessary minimum. Teacher should act as moderator (leading and moderating discussions), guide (helping slow learners) and facilitator, rather than “moralist” or “policeman” (Lakshmi, 2010: 208). Child Centred Approach and Constructivistic Model is contrary to the commands and prohibitions. Lakshmi (ibid.) illustrated by the example: “*Do not tell to the child "air has weight," let him find out himself whether or not "air has weight"*“. We add: “*Do not tell the child "no suggestion of neighbors", rather lead a discussion on the topic "Is copying from a neighbor right thing?", "What it might (ultimately) lead when sb is copying from a neighbor?"*” Teacher should increase the number of communication interactions with sentence stems or frames to encourage higher-order thinking skills (so called HOTS, such as Blooms taxonomy, see Anderson, & Krathwohl, 2001), whether in relation to subject matter or behaviour (e.g. Snowman & McCown, 2011, Havigerová & Haviger, 2012).

On the other hand, we demonstrated that a prohibition creates a stronger barrier than a command (the command was violated earlier and more frequently by our respondents than the prohibition). Hornáčková (2015) states that, in such demanding educational process is necessary to work on the assumption of its individual needs, abilities and skills, from the interested and to act positively on the development of children's competences. Under certain circumstances, it thus may be obviously beneficial.

Conclusion

The presented study focused on the phenomenon of negative commands. The results of this eye-tracker study indicate that the eye track differs only slightly depending on the type of the instruction (a negative prohibition or a positive command) – the instructions are read with approximately the same count of fixations of the same duration; however, the result may also be influenced by the identical duration of exposure to the instruction. The effect of the type of the instruction on the success rate in the subsequent test focused on detecting the properties of elements in the prohibited zone (where attention should not have been focused according to the instructions) seems as slight. We demonstrated that negative instructions have a paradoxical effect and attract attention to prohibited phenomena, and we offered several theories of various fields of science and research as the basis for interpreting this finding (theory of obedience, reactance theory, commodity theory, self-regulation theory, theory of ironic processes, agenda-setting theory). We confirmed that a prohibition creates a stronger barrier for undesirable behaviour than a command, although with a high risk of the above mentioned paradoxical effect. In conclusion, we formulated several recommendations and encouragements for pedagogical personnel to use other than negative commands in the education process.

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REFERENCES

- Adler, Melvin J. 1980. *A Pragmatic Logic for Commands: Pragmatics & Beyond*. Amsterdam, NL: John Benjamins Publishing Company. ISBN: 902722501X
- Ahmad, Maqbool. 2008. *Comprehensive Dictionary of Education*. New Delhi: Atlantic Publishers & Distributors.
- Anderson, Lorin W., & Krathwohl, David R. 2001. *A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives*. Boston, MA: Allyn & Bacon (Pearson Education Group).
- Benz, Anton, & Kühnlein, Peter. 2008. *Constraints in Discourse*. Philadelphia, PA: John Benjamins Publishing Company.
- Bergstrom, Jennifer R., & Schall, Andrew J. (Eds.) 2014. *Eye Tracking in User Experience Design*. San Francisco, CA: Morgan Kaufmann. ISBN 978-0-12-408138-3.
- Cuccio, Valentino. 2012. Is embodiment all that we need? Insights from the acquisition of negation. *Biolinguistics*, 6(3-4): 259-275.
- Danon-Boileau, Laurent. 2005. "Negation." *International Dictionary of Psychoanalysis*. Retrieved 2015 June 23 from: <http://www.encyclopedia.com/doc/1G2-3435300962.html>
- De Leeuw, Edith D.; Hox, Joop J., & Don A. Dillman. 2008. *International Handbook of Survey Methodology*. New York, NY: Lawrence Erlbaum Associates.
- Eysenck, Michael W. 2013. *Anxiety: The Cognitive Perspective. Essays in Cognitive Psychology*. Hove, UK: Lawrence Erlbaum. ISBN: 978-1-84872-817-2
- Friedenberg, Jay. 2012. *Visual Attention and Consciousness*. New York, NY: Psychology Press. ISBN: 978-1848729056
- Havigerová, Jana M., & Haviger, Jiří. 2012. Questions in the School. *World academy of science, engineering and technology* 66, 449-452. ISSN: 2010-376X.
- Havigerová, Jana M., & Karásková, Hana. 2012. "Lexical Negation in Czech Initial Education—Negative Imperatives from the Teacher's Mouth." *Procedia – Social and Behavioral Sciences*, 69:428-434.
- Havigerová, Jana M.; Křováčková, Blanka; Karásková, Hana; Krupičková, Martina, & Hana Vitová. 2014. The Exposure and Incidence of the Lexical Negation in the School Practice. *Procedia-Social and Behavioral Sciences* 112, 792-798.
- Havigerová, Jana M.; Loudová, Irena; Novotný, Radek, & Martina Krupičková. 2015. You're Welcome or Not at All? Experimental Influencing Using of Un-verbs. *Procedia-Social and Behavioral Sciences* 171, 703-708.
- Hidalgo-Downing, Laura. Negation, Text Worlds, and Discourse: The Pragmatics of Fiction. *Advances in Discourse Processes*, vol. LXVI. Stamford, Connecticut: Ablex. 2000. ISBN 1-56750-474-4
- Horn, Laurence R., & Katō, Yasuhiko. 2000. *Negation and Polarity: Syntactic and Semantic Perspectives*. Oxford University Press. ISBN: 0-19-823874-6.
- Hornáčková, Vladimíra. 2015. The Level of Development of Students' Competences in Pre-primary Education. *Procedia - Social and Behavioral Sciences* 171, 733-737
- Jansen, Esther; Mulkens, Sandra, & Jansen, Anita. 2007. Do not eat the red food!: Prohibition of snacks leads to their relatively higher consumption in children. *Appetite* 49(3), 572–577.
- Krčmář, Michal. 2011, December 25. *Prosim, neklikejte na tento odkaz! Please do not click on this link!* Retrieved from <http://www.krcmic.cz/prosim-neklikejte-na-tento-odkaz/>
- Lageman, Ellen C. 2000. *An Elusive Science: The Troubling History of Education Research*. Chicago, : The University Press of Chicago. ISBN: 0-226-46772-4.
- Lakshmi, Ganta V. S. 2010. *Methods of Teaching Environmental Science*. New Delhi, IN: Discovery Publishing House. ISBN: 978-8-1714-1839-8
- Liuzza, Marco T.; Candidi, Matteo, & Aglioti, Salvatore M. 2011. Do Not Resonate with Actions: Sentence Polarity Modulates Cortico-Spinal Excitability during Action-Related Sentence Reading. *PLoS ONE* 6(2): e16855. doi:10.1371/journal.pone.0016855.
- Loos, Eugene E.; Anderson, Susan; Day, Dwight H. Jr.; Jordan, Paul C.; Wingate, J. Douglas. 2004. "What is Negation?". *Glossary of linguistic terms*. SIL International. Retrieved from: <http://www-01.sil.org/linguistics/glossaryoflinguisticterms/WhatIsNegation.htm>
- Lüdtke, Jana, & Kaup, Barbara. 2006. Context Effects when Reading Negative and Affirmative Sentences. *Proceedings from the 28th Annual Conference of the Cognitive Science Society*. Pages: 1735-1740. Mahwah, NJ: Lawrence Erlbaum Associates. ISBN: 0-9768318-2-1
- Mancuso, Carissa E.; Tanzi, Maria G.; Gabay, Michael. 2004. Paradoxical Reactions to Benzodiazepines: Literature Review and Treatment Options. *Pharmacotherapy*, 24(9): 1177–1185. doi:10.1592/phco.24.13.1177.38089. PMID 15460178.
- Maciuszek, Józef. 2013. Don't pay attention to what you see! Negative commands and attention bias. *Polish Psychological Bulletin*, 44(1), 70-84. DOI: 10.2478/ppb-2013-0008
- Manser, Martin H., Fergusson, Rosalind & Pickering, David (Eds.) 2007. *The Facts on File Dictionary of Proverbs*. 2nd ed. New York, NY: Facts On File.



- McCombs, Max. 2005. A look at agenda-setting: Past, present and future. *Journalism Studies* 6 (4): 543-557.
- Milgram, Stanley. 1963. Behavioral Study of Obedience. *The Journal of Abnormal and Social Psychology* 67(4): 371-378.
- Mneimne, Malek; Powers, Alice S.; Walton, Kate E., et al. 2010. Emotional valence and arousal effects on memory and hemispheric asymmetries. *Brain and Cognition* 74(1): 10–17.
- Mottet, Timothy P.; Richmond, Virginia P., & McCroskey, James C. 2006. Instructional communication: The historical perspective. Boston, MA: Pearson/Allyn & Bacon. ISBN: 978-0-2053-9614-6.
- Mukundan, Champadi R. 2007. *Brain Experience: Neuroexperiential Perspectives of Brain-mind*. New Delhi: Atlantis Publishers and Distributors. ISBN 81-269-0817-3.
- Myrseth, Kristian Ove R.; Fishbach, Ayelet, & Trope, Yaacov. 2009. Counteractive Self-Control When Making Temptation Available Makes Temptation Less Tempting. *Psychological Science* 20(2): 159-163. doi: 10.1111/j.1467-9280.2009.02268.x
- Oliveira, Jorge; Gamito, Pedro; Perea, Maria, et al. 2011. Hemispheric asymmetries in recognition memory for negative and neutral words. *Journal of Eye Tracking, Visual Cognition and Emotion* 1(11): 13-21.
- Palmer, Frank R. 2001. *Mood and Modality*, 2nd ed. Cambridge: Cambridge University Press. ISBN: 0-521-80035-8.
- Pea, Roy D. 1980. The Development of Negation in Early Child Language. In Olson, David R. (Ed.). *The Social Foundations of Language and Thought: Essays in Honor of Jerome S. Bruner*. New York, N: W. W. Norton. Chapter 7: 156-186.
- Poetter, Thomas S., & Badiali, Bernard J. 2001. *Teacher Leader*. Larchmont, NY: Eye on Education. ISBN 1930556195.
- Rao, Digumarti B. 2003. *European Education and Teachers*. New Delhi: Discovery Publishing House. ISBN: 81-7141-702-7.
- Rosenberg, Sheldon. 2014. *Handbook of Applied Psycholinguistics: Major Thrusts of Research and Theory*. Hillsdale, NJ: Lawrence Erlbaum Associates. ISBN 9780898591736.
- Semrud-Clikeman, Margaret; Teeter Ellison, Phyllis Anne. 2009. *Child Neuropsychology: Assessment and Interventions for Neurodevelopmental Disorders*, 2nd Ed. New York, NY: Springer Science & Business Media.
- Sereno, Sara C.; Rayner, Keith. 2003. Measuring word recognition in reading: eye movements and event-related potentials. *Trends in Cognitive Science* 7(11): 489–93.
- Snowman, Jack, & McCown, Rick. 2011. *Psychology Applied to Teaching*. 13th ed. Belmont, CA: Cengage Learning/Wadsworth Publishing. ISBN: 9781111298111
- Staab, Jenny. 2008. *Negation in context: electrophysiological and behavioral investigations of negation effects in discourse processing*. San Diego: University Of California. ISBN: 978-0-549-29553-2.
- Sternberg, Robert J. 2009. *Cognitive Psychology*, 5th ed. Chapter 10. Wadsworth: Cengage Learning. ISBN 978-0-495-50629-4.
- Tottie, Gunnel. 1991. *Negation in English speech and writing: a study in variation*. London, UK: Academic Press.
- Veal, Mary L., & Anderson, William G. 2010. *Analysis of Teaching and Learning in Physical Education*. Sudbury, MA: Jones & Bartlett Learning. ISBN: 9780763746353.
- Walcher, Dwain N., & Peters, Donald L. 2013. *The Development of Self-Regulatory Mechanisms*. London, UK: Academic Press.
- Winerman, Lea. 2011. Suppressing the 'white bears'. Meditation, mindfulness and other tools can help us avoid unwanted thoughts, says social psychologist Daniel Wegner. *Monitor on Psychology* 42(9): 44.

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Příloha č. 2 – Výsledovka

Univerzita Hradec Králové

Dne: 10.12.2015 12:54:07

Strana 1

Výsledovka po účtech obrátová

Období: 01 - 12 / 2015

Pracoviště:	*****	Všechny vybrané analytiky
Činnost:	****	Všechny vybrané analytiky
Fullcost:	*****	Všechny vybrané analytiky
Zakázka:	2113	SV - Eye trackerová studie
Podzakázka:	***	Všechny podzakázky

Účet	Název účtu	Na poč. období	Má dáti	Dal	Zůstatek
501 003	Spotřeba materiálu kancelářské DU	0,00	24 379,00	0,00	24 379,00
501	Spotřeba materiálu	0,00	24 379,00	0,00	24 379,00
512 001	Cestovné zahraniční zaměstnanci DL	0,00	22 418,00	0,00	22 418,00
512	Cestovné	0,00	22 418,00	0,00	22 418,00
518 004	Poplatky konference, semináře, kurzy	0,00	9 351,80	0,00	9 351,80
518 099	Ostatní služby	0,00	7 928,00	0,00	7 928,00
518	Ostatní služby	0,00	17 279,80	0,00	17 279,80
521 001	Mzdové náklady DU	0,00	2 640,00	0,00	2 640,00
521 003	Mzdové náklady OON -práce DU	0,00	8 000,00	0,00	8 000,00
521	Mzdové náklady	0,00	10 640,00	0,00	10 640,00
524 001	Zákonné zdravotní pojištění DU	0,00	237,59	0,00	237,59
524 002	Zákonné sociální pojištění DU	0,00	660,00	0,00	660,00
524	Zákonné sociální pojištění	0,00	897,59	0,00	897,59
545 001	Kurzové ztráty DU	0,00	199,88	0,00	199,88
545	Kurzové ztráty	0,00	199,88	0,00	199,88
549 003	Bankovní poplatky DU	0,00	466,22	0,00	466,22
549 004	Jiné ostatní náklady Haléř.vyrovnaní l	0,00	0,50	0,00	0,50
549 093	Pojištění cestovní	0,00	220,00	0,00	220,00
549	Jiné ostatní náklady	0,00	686,72	0,00	686,72
Náklady celkem		0,00	76 500,99	0,00	76 500,99
691 006	Provoz.dotace věda MŠMTspecifický	0,00	0,00	76 500,00	76 500,00
691	Přijaté přís. mezi zúčt.mezi org.slož.	0,00	0,00	76 500,00	76 500,00
Výnosy celkem		0,00	0,00	76 500,00	76 500,00
HOSPODÁŘSKÝ VÝSLEDEK:					-0,99
Celkem náklady za vybrané:		0,00	76 500,99	0,00	76 500,99
Celkem výnosy za vybrané:		0,00	0,00	76 500,00	76 500,00
Hospodářský výsledek za vybrané:					-0,99

Výběrová kritéria (omezení sestavy se řídí právy uživatele valteja1 (uvedena v závorce))

Pracoviště: (0124*)

Činnost: (***)

Fullcost:

Zakázka: 2113 (*)

Podzakázka: