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**What makes children feel good about their work:
experimental investigation.**

Bachelor thesis

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Declaration of Authorship

I hereby declare that I wrote this thesis independently under the leadership of my supervisor and that the references include all resources and literature I have used.

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Prague, July 31, 2019

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Signature

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Abstract

This bachelor thesis analyses how perceived meaning influences child performance, mood and enjoyment when performing work-related tasks. In laboratory settings, I manipulated the level of perceived meaning that was given for completion of an easy repetitive assignment by three different treatments. In the “Recognized” condition, each completed task was awarded with verbal recognition. The experimenter in the “Ignored” condition did not care about completed work. In the “Shredded” condition, the finished task was left not only unchecked, but it was destroyed immediately after submission. I observed a strong positive relationship between how “nice” experimenter behaved and how many tasks children finished. The same held for how good children felt. In general, even small acknowledgment mattered more than the demotivating procedure, but there were some gender-specific differences. Specifically, recognition played an important role for boys. On the contrary, destroying of completed tasks had a major negative effect on girls. These aspects significantly impacted both, performance as well as mood.

Keywords

Perceived meaning, Meaningful work, Futile work, Experimental investigation, Children

Abstrakt

Tato bakalářská práce analyzuje jak vnímaný význam ovlivňuje výkon dítěte, jeho náladu a potěšení při plnění pracovních úkolů. V laboratorním prostředí byla manipulována úroveň vnímaného významu, která byla dána po dokončení snadného opakovaného úkolu třemi různými ošetřeními. Ve skupině „Uznáno“ byl každý dokončený úkol oceněn slovní pochvalou. Experimentátor se pro skupinu „Ignorováno“ o dokončenou práci nezajímal. Ve skupině „Skartováno“ zůstal dokončený úkol nejen nezkontrolován, ale byl zničen ihned po odevzdání. Z dat je možné vyčíst, že mezi tím jak pozitivně experimentátor zareagoval a kolik úkolů děti dokončily byla výrazně kladná závislost. Totéž platilo o tom, jak dobře se děti cítily. Na malém uznání záleželo více než na demotivačním prvku, ale vyskytly se určité genderově specifické rozdíly. Konkrétně pochvala hrála důležitou roli pro chlapce. Naopak zničení dokončených úkolů mělo zásadní negativní dopad na dívky. Tyto aspekty výrazně ovlivnily jak výkon, tak náladu.

Klíčové slova

Vnímaný význam, Smysluplná práce, Zbytečná práce, Experimentální výzkum, Děti

Contents

List of Tables

List of Figures

- 1. Introduction** - 1 -
- 2. Literature Review** - 3 -
 - 2.1. Specialization and meaningless jobs - 3 -
 - 2.2. Definitions of meaning - 4 -
 - 2.3. Predetermination of meaningfulness level by the type of occupation - 5 -
 - 2.4. Consequences of meaningful work - 6 -
 - 2.5. Ways to measure meaning - 7 -
 - 2.6. Concept of alienation - 8 -
- 3. Experiment** - 9 -
 - 3.1. Research task, treatments and payment scheme - 9 -
 - 3.2. Process of the experiment - 11 -
 - 3.3. Experimental design decisions and limitations - 11 -
- 4. Hypotheses** - 13 -
 - 4.1. Number of completed task sheets - 13 -
 - 4.2. Mood and task enjoyment - 14 -
 - 4.3. Potential effects of other characteristics - 14 -
- 5. Dataset and Statistical Analysis** - 15 -
 - 5.1. Treatment characteristics** - 15 -
 - 5.1.1. “Recognized” treatment - 15 -
 - 5.1.2. “Ignored” treatment - 17 -
 - 5.1.3. “Shredded” treatment - 17 -
 - 5.2. Gender characteristics** - 19 -

5.2.1. Female students	- 19 -
5.2.2. Male students.....	- 21 -
5.2.3. Gender-specific effects of experimenter’s attitude	- 22 -
6. Econometric Analysis of Data	- 24 -
6.1. Number of completed task sheets	- 24 -
6.1.1. Female performance	- 24 -
6.1.2. Male performance	- 26 -
6.2. Mood	- 26 -
6.2.1. Female mood	- 27 -
6.2.2. Male mood.....	- 28 -
6.3. Task enjoyment	- 28 -
7. Conclusion	- 30 -
References	- 32 -
Appendix 1a	- 37 -
Appendix 1b	- 37 -
Appendix 2	- 38 -
Appendix 3	- 40 -
Appendix 4	- 42 -
Appendix 5	- 43 -
Appendix 6	- 46 -

List of Figures

<i>Figure 1</i> – Performance by treatment	- 18 -
<i>Figure 2</i> – Mood by treatment	- 19 -
<i>Figure 3</i> – Female performance by treatment.....	- 20 -
<i>Figure 4</i> – Female mood by treatment	- 21 -
<i>Figure 5</i> – Male performance by treatment	- 22 -
<i>Figure 6</i> – Male mood by treatment.....	- 22 -
<i>Figure 7</i> – Average performance by gender and treatment.....	- 23 -
<i>Figure 8</i> – Average mood by gender and treatment.....	- 23 -

List of Tables

<i>Table 1</i> - Reward scheme	- 10 -
<i>Table 2</i> - Treatment characteristics	- 16 -
<i>Table 3</i> - Gender characteristics by treatment.....	- 20 -
<i>Table 4</i> – Normality tests	- 25 -
<i>Table 5</i> – Performance by treatment (mean comparison)	- 25 -
<i>Table 6</i> – Mood by treatment (mean comparison)	- 27 -

Bachelor Thesis Proposal

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Language of the work: **English**

Proposed topic:

What makes children feel good about their work?

Motivation:

Nowadays people are motivated by making an impact when doing their work. According to the recent global study by LinkedIn, 74% of young people prefer a job where they feel like their work matters. In my thesis I would like to investigate whether we gain this motivation during the process of adolescence or we have it since childhood. My research will examine if children just do their activity because they like it and do not care that it is futile work, or they care about the impact of their behaviour.

Research questions:

1. How perceived meaning influences children's activity?
2. Does perceived meaning influence children's joy of doing activity?

Expected contribution:

My thesis will answer the question whether children perceive a Sisyphus work meaningless and react with lower completion rates same as adults.

Methodology:

I will conduct an experiment to investigate the existence of perceived meaning for children. The goal of the experiment is to determine whether children consider impact of the performed activity as important as adults. Children will be randomly assigned to two groups. Based on an experiment by Ariely (2008), the first treatment will simulate meaningful condition (control treatment) and the second one Sisyphus condition. The experiment will contain

repetitive tasks, which children can deal with easily. Children can decide how many tasks will they make and will be rewarded for each finished task. The tasks will be the same for both groups with just one difference. After each repetition of a task, a demotivating procedure (e.g. destroying finished work in front of the children's eyes) will be used in the second treatment (Sisyphus condition). I hypothesize that children will produce significantly less tasks in the treatment with demotivating procedure compared to control treatment. I will compare my results with Ariely's (2008) experiment with adults.

Outline:

1. Introduction
2. Literature review
3. Design of the experiment
4. Discussion of possible results
5. Conclusion

List of academic literature:

Ariely, D., Kamenica, E., & Prelec, D. (2008). Man's search for meaning: The case of Legos. *Journal of Economic Behavior & Organization*, 67(3-4), 671-677.

Frankl, V. E. (2006). Man's search for meaning (I. Lasch, Trans.). *Boston: Beacon* (Originally published 1959).

Leete, L. (2001). Whither the nonprofit wage differential? Estimates from the 1990 census. *Journal of Labor Economics*, 19(1), 136-170.

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1. Introduction

People devote approximately one-third of the day to their jobs. Work has an important role in human's life. As individuals spend more time in their workplace, they start to think about their job as a place where they could fulfil themselves (Hoar, 2004; Holbeche and Springett, 2009). According to a recent global study conducted by LinkedIn and © Imperative (2016) with over 26 thousand responses from 40 different countries, 74% of young people prefer a job where they feel their work matters. Nowadays, humans are motivated by making a positive impact when doing their work. Meaningful work is a topic that receives increasing attention in last years (Bailey and Madden, 2016). It is, therefore, surprising that relatively small number of extensive empirical studies have been conducted so far about which role the meaning plays in jobs, how important this factor is and how it influences us (Bailey and Madden, 2016).

Imagine what would happen if all human beings would find and incarnate themselves in the meaning of their work. As an employer, it is relatively inexpensive to put focus on the meaning importance. At the same time, ignoring this aspect may be very inefficient and cost a lot not only one company but our whole society (Ariely, Kamenica and Prelec, 2008).

In my thesis, I would like to investigate whether this demand for meaningful work is inborn or learnt during adulthood. Hence, I run a laboratory experiment with grammar-school students to determine if children perform and feel better when doing tasks with perceived meaning. This thesis contributes to understanding of the concept of perceived meaning in the workplace. The goal is to compare performance, mood and enjoyment from performing some work in various controlled situations. With this intention, I created three treatments with different levels of perceived meaning given for the completed assignment. All participants worked on the same simple repetitive task. I simulated a setting where work is futile and has no meaning at all as well as a scenario with small additional meaning. These treatments corresponded to the practise applied by Ariely, Kamenica and Prelec (2008). In the first condition, so-called "Recognized", each completed task was awarded by the experimenter with verbal recognition. The experimenter in the second, "Ignored", condition did not care about student's completed work. In the last condition, the finished task was left not only unchecked, but it was destroyed immediately after submission, thus, the name "Shredded".

This bachelor thesis is structured as follows. Firstly, *Section 2* provides a brief overview of the most crucial and relevant literature on the topic of perceived meaning of work and

emphasizes its influence on labour supply. Secondly, *Section 3* introduces the methodology of my laboratory experiment. *Section 4* is devoted to precise formulation of my research questions and hypotheses. Then, data collected throughout the experiment are interpreted by basic statistical description in *Section 5*, whereas more advanced econometric analyses and their outcomes are presented in *Section 6*. Finally, summary of all my findings is outlined in *Section 7*.

2. Literature Review

2.1. Specialization and meaningless jobs

The beginnings and description of the division of labour date back to Classical economics. Adam Smith (1937 [1776]) in his book "The Wealth of Nations" expressed that specialization plays a significant role in the division of labour. He demonstrated this fact on the example of a pin factory. For workers to be more efficient and productive, it is necessary to specialize in one single particular repetitive subtask. Smith argued that the manufacturing process should be divided into multiple steps that differ but together create a complex process. Each employee is specialized and educated in one very specific task to become a specialist in that part of the procedure. Having specialized employees, that concentrate on a single step in the operation, can lead to more efficiency and higher productivity on a single subtask, unlike the same number of employees performing the whole process end-to-end. His thoughts predicted that the more specialized the workforce is, the more prosperous the society as a whole becomes. In the same book, it is mentioned and admitted that forcing individuals to devote their attention in the work only to simple repetitive actions could lead to ignorance, stupidity and dissatisfaction. Hence, governments have a responsibility to prevent this situation. This could be achieved by providing workers continuous education opportunities to stimulate them intellectually. Furthermore, it is crucial to find each worker a job which suits his needs and skills the best.

On the contrary, Karl Marx (1844) criticized Smith's specialization concept. His arguments were that it could lead to worsening of overall skills of the labour force which would result in a lack of enthusiasm during the work performance. Marx also expressed that work is what makes us humans and fulfils our "essence as species". Indeed, in the 19th century, the phenomenon of specialization and splitting jobs into very repetitive subtasks, made workers depressed, both, physically and spiritually. Karl Marx (1844) noted the description of this idea in his theory of alienation. Alienation is a concept of an individual who is isolated from society, work and the sense of self. Specialization in the capitalist mode of production drives alienation that occurs in four different types. Specifically, he differed among the alienation of a worker from his/her product, production, species-essence, and other workers.

2.2. Definitions of meaning

The impact of meaning in our behaviour and performance at work began receiving constant attention in the last century. Sigmund Freud (1955) introduced his “pleasure principle” as a driving force of the individual. This principle lies in a tendency that motivates us to avoid pain or displeasure and seek immediate gratification. On the contrary, Maslow stated that we perceive our work to be more meaningful when we are not the only ones who benefit from our effort, but when others benefit as well (Koltko-Rivera, 2006). This concept is called “self-transcendence”. It is not well-known, however, that Maslow placed self-transcendence above self-actualization in importance (Koltko-Rivera, 2006).

Several other psychologists such as Viktor Frankl (1966), Pamela Reed (1991), Lars Tornstam (1996) and Robert Cloninger (1998) agreed and contributed to the theory of self-transcendence. Viktor Frankl (1967) extended existing views with his concept of “logotherapy” - the main primary motivation is not pleasure, unlike Freud (1955) claimed in his book, but discovery and pursue of what the person finds meaningful. This quest differs among individuals. The concept also captured Loewenstein (1999) in his work “Because it is there: the challenge of mountaineering...for utility theory”. He pointed out that there are four sources of motivation, namely self-esteem, goal completion, mastery, and meaning. These are rarely incorporated into economic analysis. Moreover, these sources of utility are not limited to mountaineering, but they appear in many other economic and noneconomic activities, as well. Akerlof and Kranton (2000) presented how important the role of identity and a person's sense of self is and captured that in their economic model of behaviour. This model was discovered by incorporating knowledge of psychology and sociology into economics. In their theoretical foundations of this model, utility function was connected with different social behaviour patterns in categories such as gender discrimination in the workplace, social exclusion or household division of labour. This model proved some of contemporary well-known psychological and sociological concepts, for instance self-image, identification or self-realization into the economic outcome.

There are several methods on how to influence employees to perceive their work as meaningful. At macro level, people tend to experience their work as more meaningful when they understand the broad purpose of the organization (Chalofsky, 2010). Bailey and Madden (2015) defined a meaningful job as an authentic connection between employee's work tasks and their broader transcendent life purpose. They came to this conclusion using interpretive

methodology based on 44 one-hour-long, semi-structured face-to-face interviews with three occupational groups - academics, stonemasons, and refuse collectors. This corresponds to findings of Truss and Madden (2014).

In a different manner, Ariely, Kamenica, and Prelec (2008) argued that most employees consider their job as meaningful when there is at least some connection between work and purpose of their job whereas this purpose could be insignificant or irrelevant to the employee's personal beliefs and goals. On the other hand, if the connection is separated or does not exist at all, the work immediately becomes pointless or even degrading. This result was observed in two experiments, where they proved that although the task is less meaningful, the performance of the participant is still much higher than in futile conditions. Lips-Wiersma and Wright (2012) stated that if employee finds his/her work creative and exciting and believes that it fulfils his/her potential, this work becomes then more meaningful to him/her. It is not necessary to have the same beliefs and personal goals with the organization to experience meaningfulness towards work (Lips-Wiersma and Wright, 2012).

Recognition from others matters, too. Rosso et al. (2010) defined that the workers feel satisfaction and consider their job meaningful when their work contributes to others. Data to exhibit this phenomenon were collected by conducting a qualitative survey from various occupations.

According to another definition, whether some work is purposeful depends on how much worker's attitudes and beliefs are correlated with the meaning of the job (Lips-Wiersma and Morris, 2009; Bailey et al., 2015).

2.3. Predetermination of meaningfulness level by the type of occupation

Researches try to determine if there are some types of occupations that predetermine the level of meaning perceived by individuals working in that particular field (Rosso et al., 2010). In fact, there are two types of such occupations, which are considered as meaningful work regardless any other aspects and definitions discussed in the section above. The first one is non-profit sector (Weisbrod, 1983; Preston, 1989; Leete, 2000; Leete, 2001), to the other one belongs occupations with noble goals, such as teachers, doctors, artists or scientists (Stern, 2004; Ariely, Kamenica and Prelec, 2008).

Benz (2005) stated that professionals in the non-profit sector are generally more satisfied than people working in the for-profit sector. Burbano (2016) in his field experiment showed that

even short-term workers are willing to accept reduced wages if they see some degree of social responsibility behaviour of employers.

The latter mentioned group of meaningful occupations are considered as higher purpose ones because satisfaction from them comes from promoting their purpose, e.g. medicine helps other people in unpleasant moments. A case with scientists, specifically doctoral biologists, was examined by Stern (2004) in his paper "Do scientists pay to be scientists?". Data showed that companies that allow their employees to publish their scientific papers regularly offer on average by 25% lower salaries than the market salary in that specific field. In another words, science-oriented firms pay their employees less in exchange for being scientists and publish papers. Results are significant and robust across various samples; author studies different characterizations and control structures. To summarize, scientists have smaller monetary incentives to be scientists. Employees that comply with a mission of company they work for are more productive even for lower wage. Carpenter and Gong (2016) run a real-effort experiment with participants working for organizations that had a clear mission. They randomly split participants into two groups – subjects who agreed with employer's mission and subjects who did not. Results show that the "matched" workers are by 72 % more productive than "mismatched" workers. In addition, implications of performance wage were examined. Such payment scheme had only moderate effect on matched workers (13% increase) while mismatched workers were motivated substantially (86% increase). Besley and Ghatak (2005) extended the list of occupation with "noble" goals with judges and soldiers. They described that salaries for these mission-oriented occupations do not reflect "market prices", but an extra benefit of them is personal involvement in producing a "collective good".

2.4. Consequences of meaningful work

The importance of meaningful work has been identified and quantified in economy, psychology, sociology and philosophy (Bailey and Madden, 2017). Perceived meaning at work improves the individual's motivation, performance, productivity, commitment and satisfaction (Pratt and Ashforth, 2003; Ariely, Kamenica and Prelec, 2008).

In an article "Man's search for meaning: The case of Legos", Ariely, Kamenica and Prelec (2008) showed individual's productivity rapidly rises even with a low level of meaning. The authors simulated this by creating a setting where an individual perceived minimal meaning and compared his/her performance to a situation with no meaning at all. In addition, they observed that subject's demand for monetary incentives was lower in the meaningful

condition. Researchers showed that purpose of job is more important to workers than their wages, rewards, and opportunities for promotion (Cascio, 2003).

Based on findings of Wrzesniewski and Dutton (2001), meaning for individuals is crucial to such extent that they actively seek possibilities to recraft themselves in order to be able to consequently increase meaningfulness of their work.

A simple demonstration of how the particular position fits or serves a company's broader purpose significantly influences the perceived meaning of workers in a positive way (Ashforth and Kreiner 2013; Bailey and Madden, 2016). Managers can easily encourage meaningful perception of job by explaining to their employees what exactly their contribution to the firm's goal is (Ashforth and Kreiner, 2013). Increasing meaningfulness notion in individuals generates various cognitive, emotional and behavioural benefits for the worker (Ardichvili, 2009; Steger et al., 2012). Moreover, it increases his/her efficiency, proficiency, performance, firm's trust and devotion so the whole company and society benefits, too (Ayers et al., 2008; Long and Mills, 2010). Evidence indicates positive correlation between perceived meaningful conditions in the workplace and the level of job satisfaction (Rosso et al., 2010). Higher job satisfaction is associated with jobs with high-level purpose (Sparks and Schenk, 2001; Kamdron, 2005).

2.5. Ways to measure meaning

Many studies have tried to develop and validate a comprehensive measure of meaningful work (Guba and Lincoln 1994; Trochim, 2006; Ariely, Kamenica and Prelec, 2008; Ardichvili, 2009; Steger et al., 2012; Lips-Wiersma and Wright, 2012; Steenkamp and Basson, 2013).

For example, Lips-Wiersma and Wright (2012) created a multidimensional process-oriented measure that has several criteria. It consists of developing the inner self, unity with others, serving others and expressing full potential. In addition, there are two other aspects - being versus doing and self versus others.

Other authors, for instance Ardichvili (2009) or Steger et al. (2012), propose "Work as Meaning Inventory (WAMI)" as a way of meaning measurement. This indicator contains three core components – firstly a degree to which work has its significance and purpose, secondly contribution to a broader meaning in life and eventually desire for contributing to the greater good.

Next qualitative measurement involves four explicit assumptions for meaningful conditions - credibility, transferability, dependability, and confirmability (Guba and Lincoln, 1994; Trochim, 2006; Steenkamp and Basson, 2013).

2.6. Concept of alienation

A situation when individual does not feel well and suffers in a job is called alienation syndrome (Cummings and Manring, 1977; Steenkamp and Basson, 2013). Cummings and Manring (1977) stated five dimensions of the alienation syndrome in the working space - work-powerlessness, normlessness, meaninglessness, negative self-evaluative involvement, and instrumental work orientation. Results show that there is a significant relationship between these five phenomena and work-related behaviour that can be expressed in a form of effort, performance, absenteeism, and tardiness (Steenkamp and Basson, 2013). To illustrate it on an example by Cummings and Manring (1977) and their study conducted with 96 male blue-collar workers, employee suffering from alienation syndrome puts less effort into his/her work which usually results in worse performance. For this bachelor thesis, I use the dimension of meaninglessness. This can be described as the incapability to see and understand the purpose of their own job (Shepard, 1971; Cummings and Manring, 1977; Guba and Lincoln, 1994; Trochin, 2006).

Alienation decreases both job satisfaction and job involvement (Fedi et al., 2016). The individuals lose productivity, quality of work and innovation thinking (Steenkamp and Basson, 2013). Evidence based on 283 workers in construction and consultancy companies in the United Kingdom showed that work alienation is strongly associated with individual and organizational outcomes (Shantz et al., 2015). A study on 493 health professionals working in public universities and private hospitals conducted by Kartal (2018) revealed that participants' engagement and alienation has a significant influence on performance. Results indicate that powerlessness and meaninglessness levels decrease health professionals' performance.

Fedi et al. (2016) also suggested that there are few differences between high-status and low-status positions. Locus of control has an impact on high-status positions. For low-status professionals matters if their decision-making is observed and criticised.

Singh and Randhawa (2018), presented a theoretical model, which tries to recognize the potential predictors or antecedents of work alienation with its possible consequences.

3. Experiment

To determine whether and to what extent perceived meaning influences child activity, I run a field experiment with grammar-school students. The design of the experiment was based on the analysis by Ariely, Kamenica and Prelec (2008) in their study “Man's search for meaning: The case of Legos“.

All participants were asked to perform the same easy repetitive task. The task assignment was prepared in a way that everyone can complete it without any difficulty. Each group of subjects was randomly assigned to one of three conditions simulating different levels of perceived meaning given for the work done.

The experiment was held at a grammar school in Tišnov with three classes of 91 students between 15 and 16 years old. Data were collected in February 2019. In the experiment, I focused on the number of completed tasks by each participant and their subsequent mood.

3.1. Research task, treatments and payment scheme

The experiment consisted of three individual treatments, each corresponding to the practise applied by Ariely, Kamenica and Prelec (2008):

- In the “Recognized” condition, students were asked to sign every task sheet with their full name. After completing the task, students handed the sheet to the experimenter, who looked at their finished work and said “Thank you, well done.” during writing down points to the student. Experimenter stored the task sheet in a file. This experimenter attitude was supposed to signalize students that their work was meaningful and appreciated.
- In the “Ignored” condition, students were not asked to write their names¹. After completing the task, students handed the sheet to the experimenter, who did not look at it and put the finished work straight to the file. Without any comments, points were written down to the student. This treatment intended to signalize students that experimenter did not care about the outcome of their work.
- In the “Shredded” condition, students were not asked to write their names¹. After completing the task, students handed the sheet to the experimenter who did not look at it and immediately tore their finished work apart in front of their eyes. Without any

¹ There were no instructions to write names. As expected, during the experiment nobody wrote his/her name on the sheet.

comments, points were written down to the student. This treatment was designed to demonstrate subjects their work was meaningless, and its outcome would not have any impact.

Each class with 30 or 31 students was randomly assigned to one of above-described treatments. Students of all classes were unaware that any class before and after them is taking part in the experiment.

The experimenter's behaviour of work recognition differed in each condition; however, the task assignment was the same for everyone. Students were given a sheet of paper with an apparently random set of letters (see *Appendix 1a* for the "Recognized" treatment and *Appendix 1b* for the "Ignored" and "Shredded" treatments). The task was to find 10 sets of two letters of "v" right next to each other, i.e. "vv", and mark them.

Completing the first sheet of paper was rewarded by 90 points. For each following sheet, students received 10 point less than for the previous one, i.e. the second sheet of paper was rewarded by 80 points, the third by 70 points and so on (for complete reward scheme, see *Table 1* below). After finishing the ninth task sheet, subjects did not gain any additional points. The maximum obtained score was 450 points. Students decided independently how many task sheets they were willing to complete. The process proceeded until the student refused to continue and stop the experiment. This was a point where the reward for completing next task was not worth their effort. The experiment lasted a maximum of 30 minutes. For each 10 points gained in the experiment, 1 CZK was paid.

Table 1- Reward scheme

# of completed sheets	Points per particular sheet	Total # of points	Final reward
1	90	90	9 CZK
2	80	170	17 CZK
3	70	240	24 CZK
4	60	300	30 CZK
5	50	350	35 CZK
6	40	390	39 CZK
7	30	420	42 CZK
8	20	440	44 CZK
9	10	450	45 CZK
10+	0	450	45 CZK

3.2. Process of the experiment

The process was divided into 3 stages. Firstly, the full set of instructions (see *Appendix 2*) was distributed to students and read out loud by the experimenter to inform about the experiment procedure. To get everyone familiar with the rules, an extra time was given for self-reading and potential questions. Secondly, the main part of the experiment began by distributing the task sheets. In this stage, treatments (“Recognized”, “Ignored” and “Shredded”) were applied by the experimenter as subjects handed out their finished work. Subjects completed task sheets independently and did not interact with each other. When a participant decided to stop the experiment, (s)he was asked not to interrupt the others and do whatever (s)he wanted. To be able to determine other aspects like gender, age, satisfaction with the completed task, learning disabilities, reading habits and self-satisfaction, the short questionnaire was collected in the third stage of the experiment (for complete set of questions, see *Appendix 3*). Eventually, participants came for their rewards.

The experiment was conducted in one day during lessons which followed each other in order to prevent communication between the participants about the experiment content. Moreover, students were unaware of the exact purpose of the study and differences between each condition. To minimize effect of engaging students in the task just to avoid actual lesson content and regular examination, collecting data took place in 45-minute long art class. There students had a possibility to stop the experiment at any point and continue with their own paintings from previous lessons.

All experimental sessions were conducted by one experimenter. To avoid any misunderstandings, the communication language of the experiment was Czech.

3.3. Experimental design decisions and limitations

To determine the length of the assignment and appropriate reward scheme, a pilot experiment was conducted. This test session was mainly intended to examine different modifications of the task to avoid any difficulties with its completion by selected group of participants, i.e. fifteen and sixteen-year-old students. Specifically, my aim was to create such set-up in which approximately three quarters of these students would be able to get full reward in 30-minute time span. This limitation was given by the fact that a regular lesson in Czech grammar school is 45 minutes long. Some time before and after the experiment is needed for instructions, questions and questionnaire.

The institute of grammar school was chosen because I expect that these students would properly understand instruction and rules of the experiment. Also, such general four-year-long grammar school does not have any specialisation and I assume that there are no specific students who could potentially lead to data biases. Classes that participated in the experiment were picked from the same school year – they were first graders. Since students are systematically divided into classes according to their success in the national comparative test for high-school admission to create classes with the similar “mixes”, I suppose there were minimal performance differences between the classes, and thus treatments.

By the apparent absence of monitoring and checking the correctness of the completed task, participants had the possibility to cheat in all conditions. The lowest incentives to cheat were in the “Recognized” condition where subjects signed each completed task. In the “Ignored” condition, subjects may have been less inclined to deceive than in the “Recognized” condition due to seeming lack of information to track the sheets to a subject. The highest incentives to cheat were in the “Shredded” treatment where the sheet of paper was obviously not checked by experimenter at all instead it was destroyed immediately in front of their eyes.

Since all participants from one class were together in a room they could have been influenced by visual contact. I admit children are naturally competitive, yet interim results were not displayed and without constant looking at their classmates, they could not know how the rest was doing.

4. Hypotheses

There are two main areas of interest in this research. Firstly, I examine how each treatment affects performance. Secondly, I observe a link between experimenter's attitude and participants' mood and enjoyment of performing the activity.

Thus, I have defined the following research questions to be answered by my experimental evidence:

Research question #1: *How does perceived meaning influence student's performance?*

Research question #2: *Does perceived meaning influence student's mood and joy of doing assigned task?*

4.1. Number of completed task sheets

The essential goal is to compare the number of completed task sheets by participants in each treatment. I assume that performance differences between participants in various treatment occur purely as a result of experimenter's attitude and class-specific effects are negligible thanks to the distribution of students to classes based on national comparative test (for more detailed argumentation, see *Section 3.3.*).

Hypothesis #1: *Increased perceived meaning has a positive influence on student's performance.*

The hypothesis to my first research question presumes that if experimenter exhibits the task as meaningful, participants complete higher number of task sheets (Ariely, Kamenica and Prelec, 2008). I suppose the reason is that motivation of students in the "Recognized" condition is positive feedback as well as obtained reward. On the contrary, in the "Ignored" condition the benefit of finishing task sheets is purely monetary. Finally, in the "Shredded" condition, demotivating procedure in form of destroying finished work in front of participants' eyes plays an additional negative role.

This hypothesis is supported by the experimental evidence of Ariely, Kamenica and Prelec (2008). Their results show that the highest number of finished task sheets is done by the "Recognized" group. The lowest number of completed assignments is in the "Shredded" condition, while the performance of participants in the "Ignored" condition is between these two, closer to the "Shredded" condition. This argument also supports studies by Pratt and

Ashforth (2003), Ayers et al. (2008) and Long and Mills (2010) which alike claim that perceived meaning improves individual's productivity.

4.2. Mood and task enjoyment

Hypothesis #2: *Increased perceived meaning has a positive effect on student's mood joy of doing assigned task.*

My second hypothesis expects analogous relationships to performance with regards to mood and enjoyment. I predict that participants' mood and joy of doing the task increases with increasing level of perceived meaning. Furthermore, positive feedback improves their mood, as well. Hence, participants' mood and joy are higher in the "Recognized" condition than in the "Ignored" and "Shredded" treatments. On the contrary, in the "Shredded" condition, I suppose that destroying their work diminishes their joy from the activity and worsens their mood.

Many studies demonstrate that doing meaningful tasks boosts mood and level of satisfaction with the job (Pratt and Ashforth, 2003; Ariely, Kamenica and Prelec 2008). Putting focus on the meaningfulness of performed task generates emotional benefit (Ardichvili, 2009; Steger et al., 2012). Recognition in a form of positive instant feedback positively influences participants satisfaction (Rosso et al., 2010).

Taking that in account, I expect that if the level of perceived meaning of the task is increased, participants report better actual mood and higher joy of doing the task in the ex-post survey.

4.3. Potential effects of other characteristics

In addition to above-mentioned propositions, I also control and examine factors such as gender, age, disability or reading habits and their relation to performance and mood to see whether there are any further important patterns which are, however, not yet reported in the literature. I presume that gender and age differences (participants were either 15 or 16 years) do not impact participant's performance and mood. Regarding disability, I expect that students with diagnosed dyslexia or dyscalculia may have reduced speed of doing the task (negatively affecting reading or counting or both), therefore their results are worse than average. Opposite holds for readers, I assume they may have an advantage against subjects that do not read that often. On the contrary, I suppose there are no such consequences of two latter discussed characteristics on participants' mood.

5. Dataset and Statistical Analysis

Herein I present outcomes of statistical analyses conducted on the sample consisting of 91 students from 3 classes. Nobody refused to participate before the start of a session. All participants were 15 or 16 years old (56 and 35 students respectively). Boys represented 44%, the remaining 56% were girls.

Overall, the average number of finished tasks was 7.87 per person. According to the survey at the end of each session, 75% subjects were satisfied with their result in the experiment with respect to the number of finished task sheets.

After the experiment, the correctness of the task sheet completion was checked, as well. Only 9 tasks sheets, representing 1.25% of the total (717), were submitted incomplete. Specifically, participants marked 9 sets of "vv" in 8 cases and once a participant missed 2 sets of "vv" in a task sheet that was handed out as finished. As intended by the experimental design, the low error rate proved that the task was simple enough and nobody had difficulty to complete it.

The outcome of further analysis using more advanced methods than in this data description and statistical analysis part, such as various significance tests, is reported in the following chapter – see 6. *Econometrics Analysis of Data*.

5.1. Treatment characteristics

Table 2 below summarizes basic information and observed indicators per treatment. For graphic comparisons of treatments see also *Figure 1* and *Figure 2* at the end of this section. Furthermore, findings for each condition are discussed in three following subchapters.

5.1.1. "Recognized" treatment

In the "Recognized" condition, 30 students participated in the experiment. Most of them was fifteen years old (22 participants), the remaining were sixteen years old (8 participants). Overall, these 14 boys and 16 girls completed 255 tasks. 16 out of 30 subjects received full reward (i.e. reached in total 9+ finished task sheets – for all information about payment scheme see *Section 3.1*). 11 of them were willing to work further without any additional reward. On average, a participant completed 8.5 task sheets, the mean equals 9. The maximum number of task sheets completed and handed out in time limit was 15. On the contrary, one participant did not like the task and stop the experiment after finishing her first sheet. Her reward for the experiment was refused, too.

Table 2- Treatment characteristics

	Recognized		Ignored		Shredded	
Participants						
# of participants	30		31		30	
% of participants	33%		34%		33%	
Gender						
# of boys and girls	14	16	13	18	13	17
% of boys and girls	46.67%	53.33%	41.94%	58.06%	43.33%	56.67%
Performance						
# of completed task sheets	255		238		224	
% of completed task sheets	36%		33%		31%	
Average	8.50		7.68		7.47	
Relative change in average*	0%		-10%		-12%	
Minimum	1		5		2	
25th percentile	7		6		7	
50th percentile	9		7		7.5	
75th percentile	10		9		9	
Maximum	15		14		12	
Ex-post survey results						
Average mood	5.57		4.84		4.13	
Relative change in average*	0%		-13%		-15%	
# of subjects that liked the task	27		26		21	
% of subjects that liked the task	90%		84%		70%	
# of subjects that disliked the task	3		5		9	
% of subjects that disliked the task	10%		16%		30%	
# of subjects that reached their goal	21		24		23	
% of subjects that reached their goal	70%		77%		77%	

* As basis for the comparisons, the "Recognized" condition is used.

Mood reported in the ex-post survey on the scale from 1 (*bad*) to 7 (*excellent*).

In the survey after the experiment, participants expressed their mood on the scale from 1 (*bad*) to 7 (*excellent*). Subjects in the "Recognized" condition felt very good; they evaluated their mood on average with grade 5.57. In fact, more than 1 in 4 students indicated his/her mood as excellent and selected the highest grade. The vast majority (90 %) stated that they enjoyed the work on experimental task. 9 participants felt that they did not manage to complete the number of task sheets they wanted.

Only two from 255 submitted task sheets were filled incorrectly (0.8%). In both handed out task sheets, just 9 out of 10 sets "vv" were marked.

Three participants reported dyslexia. Their average number of completed task sheets was 8, which is just slightly lower than the average of the rest of group (8.56).

Over two thirds (70%) of participants read a book, newspaper or magazines at least 2-3 times per week.

5.1.2. “Ignored” treatment

A total of 31 participants attended the experiment in the “Ignored“ condition. Girls represented larger part than boys (58% and 42% respectively). Fifteen-year-old students accounted for 58%, the rest of the group was sixteen years old. Students finished 238 task sheets overall - that is by 7% less than the total for previous group working under the "Recognized" condition. On average, a participant completed 7.7 task sheets. The maximum number of submitted task sheets was 14 and the minimum 5; the mean of this condition equals 7. The full reward for the experiment received only 11 people which is lower by third when comparing with 16 participants in the "Recognized" condition. Only 13% students completed more than 9 task sheets and continued working without any additional reward.

Students in the “Ignored” condition described their satisfaction with average grade of 4.84 in the ex post survey. The overall average mood decreased by 13% compared to "Recognized" condition. Only one participant expressed the highest point of the feeling on the scale. 16 % of subjects stated that they did not like the task. Majority of participant (24) finished the number of task sheets they wanted. Students in the "Ignored" condition were 7.4% more successful in achieving their goal than in the "Recognized" condition.

Almost all sheets (234 from 238) were completed correctly. One set of "vv" were missing in 3 task sheets and in one sheet there was marked only 8 out of 10 sets of "vv". Two of these incorrectly completed sheets was submitted by one boy with dyslexia and dyscalculia.

From the whole group, only two students stated that they possess a cognitive disorder, i.e. dyslexia, dyscalculia or both. These participants completed 5 and 7 task sheets, that is on average 1.8 task sheet below performance of the rest of group. However, since more than half of the group (16 out of 31) completed 7 or less task sheets, these participants are not considered as outliers. Furthermore, since this study examines population as a whole, it does not exclude people suffering from any kind of disorder.

Over half (58%) of students read a book, magazine or newspaper at least 2-3 times per week.

5.1.3. “Shredded” treatment

The "Shredded" condition group consisted of 30 subjects. Similar to groups under previous conditions, girls slightly dominated boys (57% vs. 43%). Subjects completed in total 224 tasks, which is the least from all conditions. The average number of the completed task sheets

was 7.5 sheets – that is lower by 12% in comparison with the "Recognized" condition and by 2% in comparison with the "Ignored" condition. The full reward was received by 13 students, 5 of them were willing to work without any additional money. The maximum number of task sheets completed was 12 and minimum 2, the mean equals 7.5.

Participants evaluated their mood with average grade of 4.13. One third of participant expressed their below-average feelings, and only one student marked the highest grade. Mood of participants in this condition was by 15% worse than in the "Recognized" condition. One in three subjects stated that they did not enjoy working on the task. Surprisingly, only seven people did not manage to complete the number of sheets they would submit without time limit. This proportion of students who achieved their goal was higher by 6.7% than in the "Recognized" condition and lower by 0.7% than in the "Ignored" condition.

3 out of 224 completed task sheets were submitted incomplete, all three different participants marked only 9 out of 10 sets of "vv".

One participant of this group reported cognitive disability; specifically dyscalculia. Her number of completed task sheets was 6 which is below average. However, she stated that this number of the submitted task was her target, and the goal was reached.

Sixteen students read a book, magazine or newspaper at least 2-3 times per week.

Figure 1 – Performance by treatment

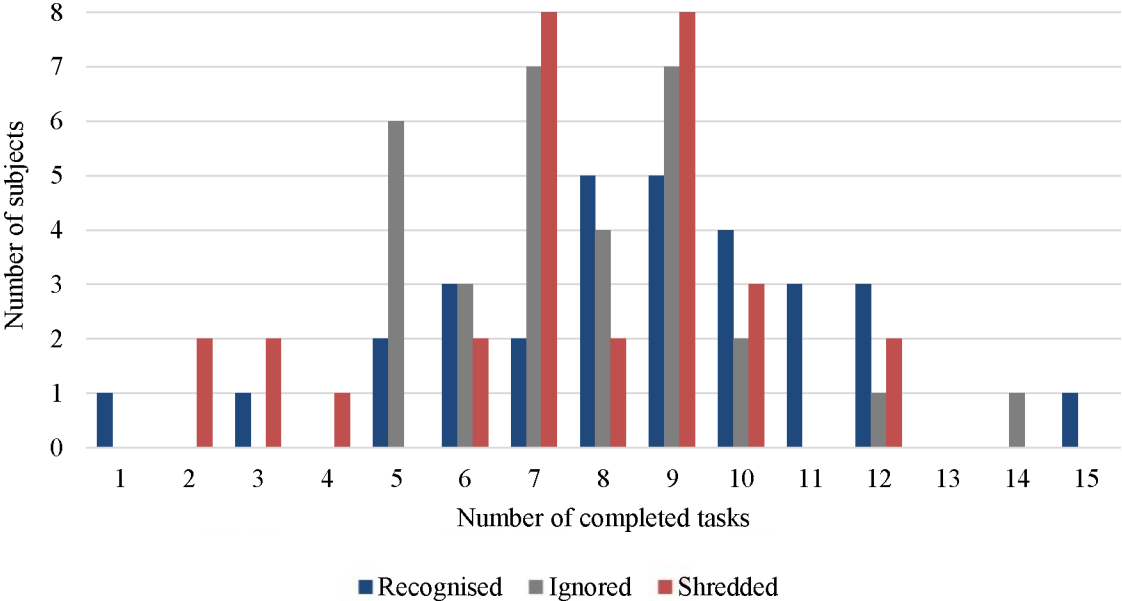
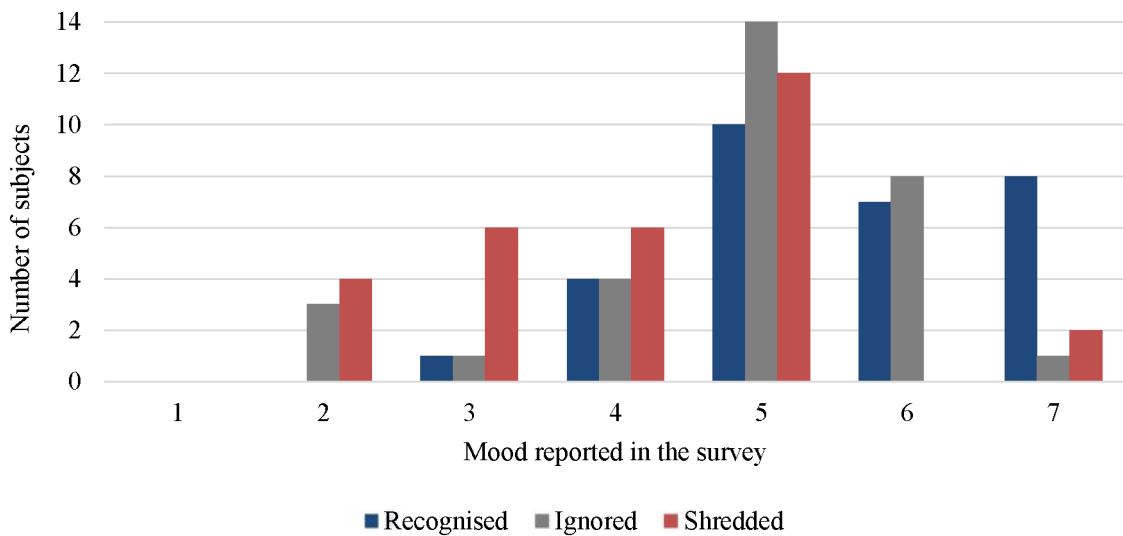


Figure 2 – Mood by treatment

Note: Mood reported in the ex-post survey on the scale from 1 (bad) to 7 (excellent)



5.2. Gender characteristics

51 female and 40 male students participated in the experiment. Girls completed on average 7.96 and boys 7.77 task sheets. Also, the mood reported by girls after the experiment was slightly better, specifically 4.88 vs. 4.77. Regarding cheating, boys submitted 5 task sheets incomplete (0.125 per male participant) compared to 4 unfinished assignments by girls (0.78 per female participant).

Table 3 below summarizes basic information and observed indicators per gender and treatment. Furthermore, all relevant findings are discussed in two following subchapters. For graphic comparisons of treatments for specific gender, there are also included Figures 3 to 6. Eventually, Section 5.2.3. concludes with comparison of responses of female and male participants to experimenter's attitude.

5.2.1. Female students

In the "Recognized" condition, the average number of task sheets done by 16 corresponding girls was 8.31. Over half of the female students (9 girls) completed at least 9 tasks for which they received the full reward, and nearly 44% of them (7 girls) were willing to continue working without any additional reward. Female participants from this class described their mood as relatively good - 5.38. Furthermore, 81% of female enjoyed doing the task.

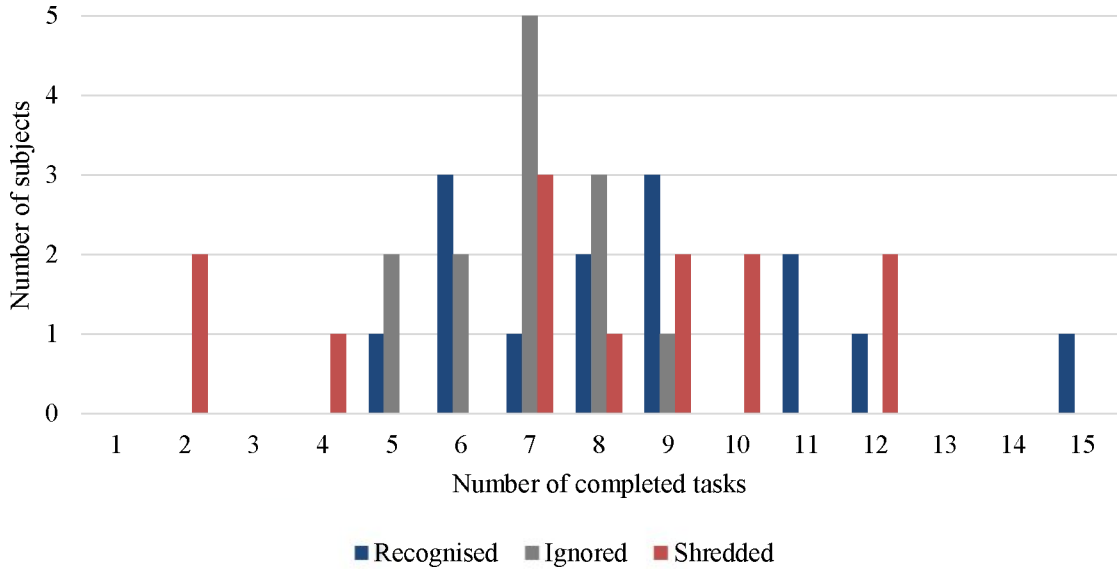
The "Ignored" treatment class consisted of 18 girls, and their average number of completed task sheets was 8.22. One-third of these female participants finished their work after completing 9th tasks. Similar to the performance difference, girls in this group evaluated their level of mood as slightly worse with the average grade of 5.22. The vast majority (83%) of girls liked doing the activity.

Table 3- Gender characteristics by treatment

	Female			Male		
	Recognized	Ignored	Shredded	Recognized	Ignored	Shredded
Participants						
# of participants	16	18	17	14	13	13
Performance						
Average # of completed task sheets	8.31	8.22	7.35	8.71	6.92	7.62
Relative change in average*	0%	-1%	-12%	0%	-21%	-13%
Ex-post survey results						
Average mood	5.38	5.22	4.06	5.79	4.31	4.23
Relative change in average*	0%	-3%	-25%	0%	-26%	-27%
# of subjects that liked the task	13	15	13	14	11	8
% of subjects that liked the task	81%	83%	76%	100%	85%	62%
# of subjects that disliked the task	3	3	4	0	2	5
% of subjects that disliked the task	19%	17%	24%	0%	15%	38%
# of subjects that reached their goal	11	15	12	10	9	11
% of subjects that reached their goal	69%	83%	71%	71%	69%	85%

* As basis for the comparisons, the "Recognized" condition is used.

Figure 3 – Female performance by treatment

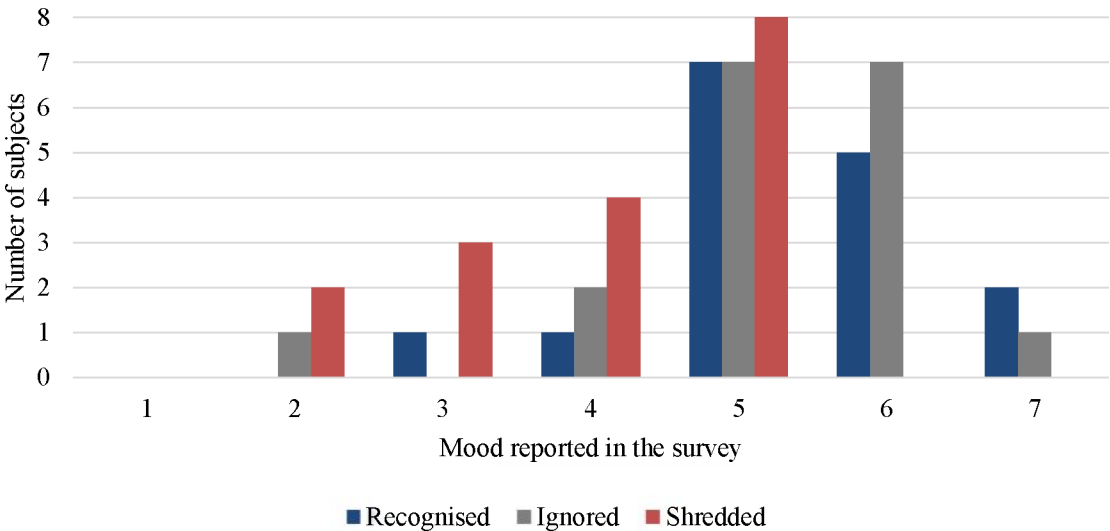


A total of 17 students attended the experiment in the "Shredded" condition with an average of 7.35 completed task sheets per female participant. This average is by 12% lower in comparison with the "Recognized" treatment and by 11% lower in comparison with the

"Ignored" treatment. The same number of female students as in the "Ignored" condition completed 9 task sheets and received the full reward for their performance in the experiment. Girls from the "Shredded" condition described their mood as the worst among female participants from other classes with the average of 4.06. That is by 24% lower than in the "Recognized" condition and by 2% lower than in the "Ignored" condition. Besides, four female students did not like given task. This is the highest number among all conditions, too.

Figure 4 – Female mood by treatment

Note: Mood reported in the ex-post survey on the scale from 1 (bad) to 7 (excellent)



5.2.2. Male students

The group in the "Recognized" treatment included 14 boys. These boys achieved the highest average number of completed task sheets equal to 8.7 per male participant. They described their mood in the ex-post survey with the average grade of 5.79. In addition, all of them enjoyed doing the activity.

In the "Ignored" treatment, there were 13 male participants in the experiment. On average, they completed 6.9 task sheets, which was the lowest measured average among all classes. Only one boy received the full reward by completing 9 tasks. 85% of these male participants reported that they liked the task. Participants expressed their mood on the level of 4.31.

13 boys in the sample participated in the "Shredded" treatment with the average of 7.62 task sheets completed. This number is by 13% lower than the average performance in the "Recognized" condition, but by 9% higher in comparison with the "Ignored" condition. The

average mood on the level of 4.23 decreased by 27% compared to the "Recognized" condition and by 1% compared to the "Ignored" condition. Enjoyment from doing the task was the lowest from all subgroups, only 62%.

Figure 5 – Male performance by treatment

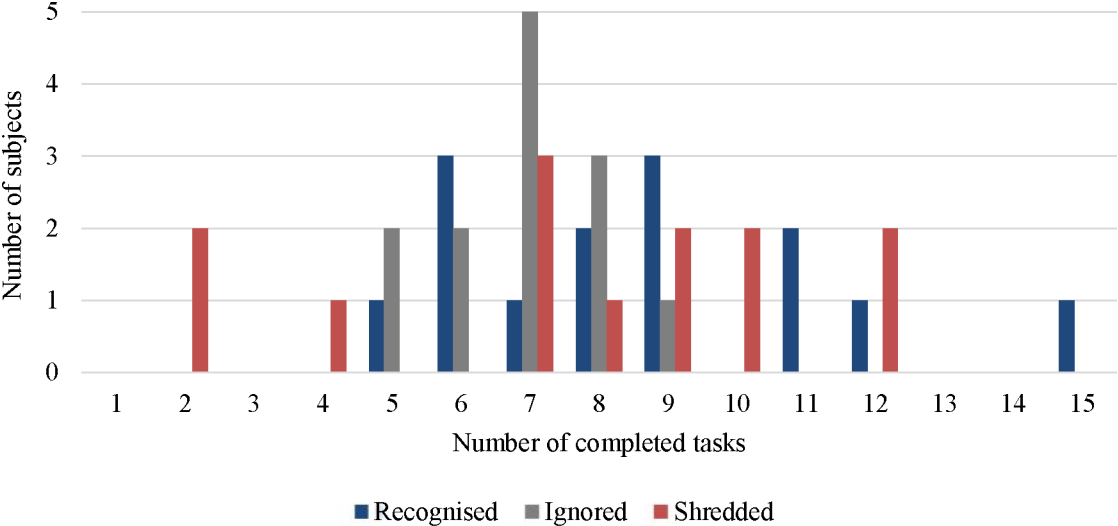
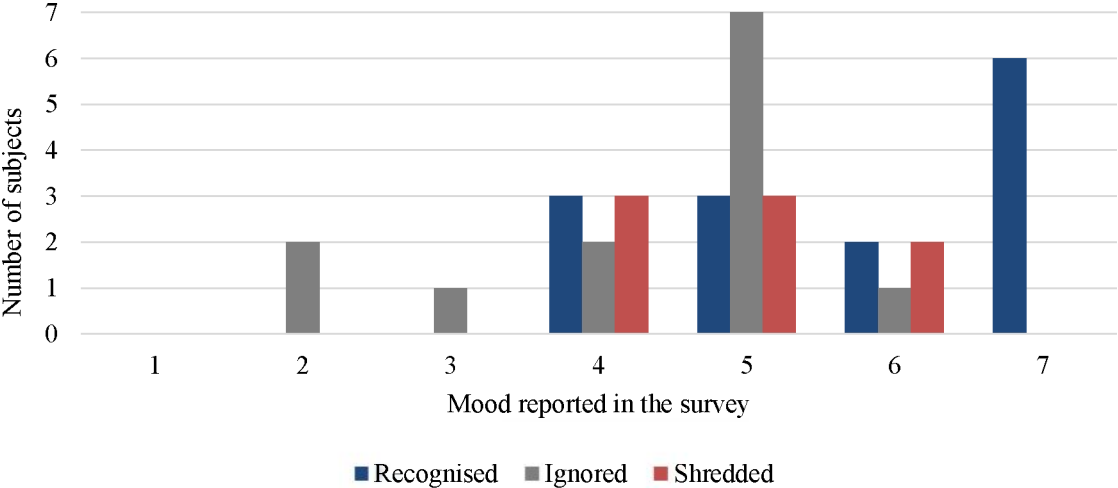


Figure 6 – Male mood by treatment

Note: Mood reported in the ex-post survey on the scale from 1 (bad) to 7 (excellent)



5.2.3. Gender-specific effects of experimenter’s attitude

Figure 7 and 8 below visualize the average number of completed task sheets and mood reported by girls and boys in each treatment. The illustrations suggest that male subjects responded to recognition with increased performance and mood, and the demotivating

procedure in the “Shredded” treatment did not affect them to such extent. Female participants seemed to behave in the completely opposite manner. In the “Recognized” and “Ignored” treatment, they finished similar number of task sheets and reported alike mood; on the contrary, there was a notable slip in both factors when completed assignments were tore apart in front of girl’s eyes. These differences indicate possible gender-specific effects and my hypothesis regarding genders from *Section 4.3* needs to be tested further.

Figure 7 – Average performance by gender and treatment

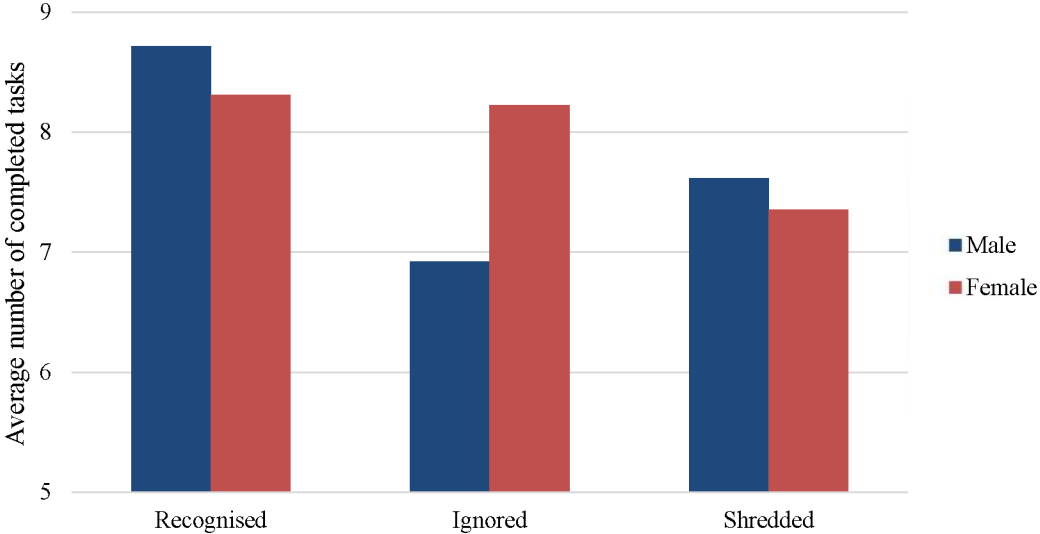
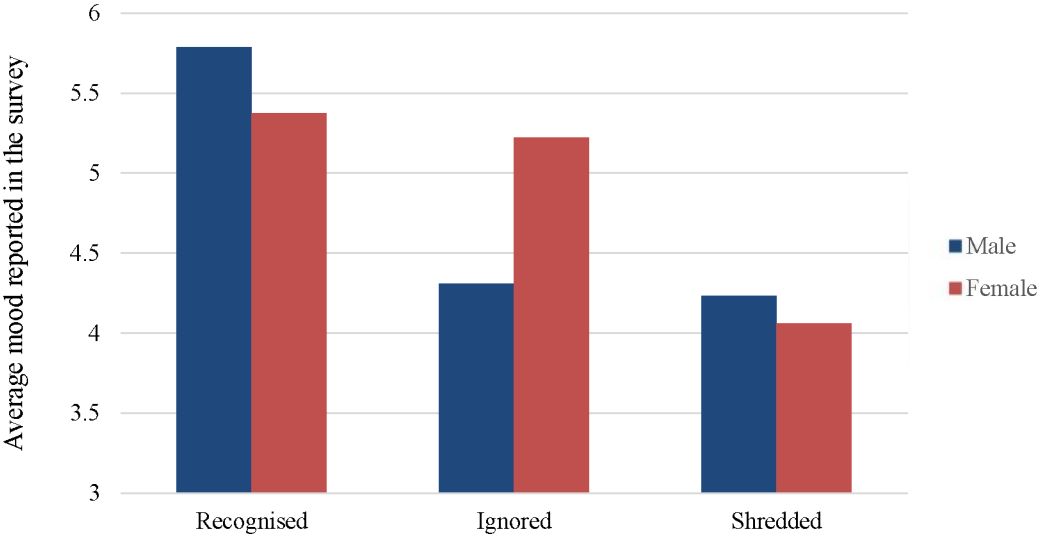


Figure 8 – Average mood by gender and treatment

Note: Mood reported in the ex-post survey on the scale from 1 (bad) to 7 (excellent)



6. Econometric Analysis of Data

6.1. Number of completed task sheets

Recognition seems to have stimulated better performance. Subjects in the class where work was appreciated by the experimenter completed considerably higher number of task sheets than their peers in two other classes. All mean comparison statistics indicate significant difference at least at 10% level:

- “Recognized” vs. other conditions: t-test, one-sided, $t = -1.629$ and $p = 0.0534$; Wilcoxon rank sum test, two-tailed, $z = -1.788$ and $p = 0.0738$;
- “Recognized” vs. “Ignored” condition: Wilcoxon rank sum test, two-tailed, $z = -1.667$ and $p = 0.0955$;
- “Recognized” vs. “Shredded” condition: t-test, one-sided, $t = -1.451$ and $p = 0.0766$.

To show the whole picture, there was no performance difference between subjects from “Ignored” and “Shredded” treatment (Wilcoxon rank sum test, two-tailed, $z = 0.249$ and $p = 0.8031$).

I conducted several t-tests and Wilcoxon rank sum tests to examine these mean distinctions. As a prerequisite, it was crucial to determine how the variable *points* is distributed in individual subsets since t-tests could be applied only for comparisons of normally distributed data². By running Shapiro-Wilk test (where H_0 stands for normal distribution), I concluded that the performance indicator follows approximately normal distribution for all previously investigated groups except for the class that was assigned to the “Ignored” treatment (Shapiro-Wilk test, $z = 1.514$ and $p = 0.065$). The output of tests for normality is summarized in *Table 4* below. Moreover, histograms in *Appendix 5* showing *points* distributions correspond to above-stated findings. For example, from the graph for the “Ignored” condition the non-normal distribution is obvious since a tail for low amounts of points is missing.

6.1.1. Female performance

The demotivating procedure played an important role for female participants as the analysis suggests. Girls in the class where their work was futile and completed task sheets were immediately destroyed performed significantly worse compared to female subjects that

² This assumption applies for subsets with small sample size.

received recognition (Wilcoxon rank sum test, two-tailed, $z = -1.642$ and $p = 0.1005$ for the “Recognized” vs. “Shredded”). Points gained in the experiment for other subsets of girls did not statistically differ - see test results in *Table 5* below.

Table 4 – Normality tests

	Recognized	Ignored and Shredded	Ignored	Shredded
	z-statistics (p-value)			
Variable points				
<i>All</i>	-0.959 (0.83126)	-0.188 (0.57467)	1.514* (0.06498)	0.559 (0.28817)
<i>Female</i>	1.257* (0.10436)	-0.687 (0.75386)	0.128 (0.44915)	2.677*** (0.00372)
<i>Male</i>	-0.232 (0.59180)	-1.235 (0.89164)	0.132 (0.44734)	-1.058 (0.85502)
Variable mood				
<i>All</i>	-0.499 (0.69106)	0.383 (0.35080)	2.478*** (0.00660)	-1.456 (0.92731)
<i>Female</i>	-1.116 (0.86771)	1.497* (0.06721)	0.959 (0.16883)	1.832** (0.03349)
<i>Male</i>	-1.147 (0.87437)	-1.595 (0.94468)	2.818*** (0.00242)	-2.549 (0.99460)

z-statistics and p-values in parentheses from Shapiro-Wilk test investigating normality of distribution (H_0 stands for normal distribution)

Note: ***($p < 0.01$), **($p < 0.05$) and *($p < 0.1$)

Table 5 – Performance by treatment (mean comparison)

	Recognized vs. Other		Recognized vs. Ignored		Recognized vs. Shredded		Ignored vs. Shredded	
	z-statistics	t-statistics	z-statistics	t-statistics	z-statistics	t-statistics	z-statistics	t-statistics
(p-value)								
Variable points								
<i>All</i>	-1.788* (0.0738)	-1.6293* (0.0534)	-1.667* (0.0955)		-1.418 (0.1561)	-1.451* (0.0766)		0.249 (0.8031)
<i>Female</i>	-1.288 (0.1978)		-0.611 (0.5411)		-1.642 (0.1005)			-0.864 (0.3877)
<i>Male</i>		-1.693** (0.0493)		-2.143** (0.021)		-0.9367 (0.1789)		-0.7108 (0.758)

t-statistics from Student's t-test and z-statistics from Wilcoxon rank sum test comparing means of two independent samples (H_0 : there is no difference between means of these samples), corresponding p-values in parentheses

Note: ***($p < 0.01$), **($p < 0.05$) and *($p < 0.1$)

In female subgroups defined by treatments, it is possible to consider the variable *points* as normally distributed for “Ignored” treatment and “Ignored” and “Shredded” treatment combined. For the other two, the null hypothesis of Shapiro-Wilk test can be rejected. For more detailed information regarding the performance indicator distribution see *Table 4* above and histograms in *Appendix 5*.

6.1.2. Male performance

Male performance looks to have been positively impacted by experimenter's acknowledgment and recognition. Tests show that in the "Recognized" condition boys finished significantly higher number of task sheets in comparison with their peers from other two classes (t-test, one-sided, $t = -2.143$ and $p = 0.021$) as well as the "Ignored" condition (t-test, one-sided, $t = -1.693$ and $p = 0.0493$). The mean of points achieved by male participants in the "Recognized" condition is not significantly higher than for the "Shredded" treatment. Similarly, the performance of boys in the "Ignored" and "Shredded" group was the same. All test outcomes are outlined in *Table 5* above.

The variable *points* follows approximately normal distribution for all male data subsets defined by treatments. See *Table 4* for corresponding statistics and *Appendix 5* for graphical illustrations.

6.2. Mood

Mood reported in the ex-post questionnaires was very sensitive to experimenter's attitude. On the one side, receiving a recognition after submitting the finished task sheet seem to have positively influenced how participants felt. Conversely, mood of participants whose assignments were torn apart was worse compared to all other treatments. All corresponding test results are significant at 5% level, some conclusions can be made with 99% confidence – see precise outcome summarized in bullet points or *Table 6* below:

- "Recognized" vs. other conditions: t-test, one-sided, $t = -3.808$ and $p = 0.0001$; Wilcoxon rank sum test, two-tailed, $z = -3.468$ and $p = 0.0005$;
- "Recognized" vs. "Ignored" condition: Wilcoxon rank sum test, two-tailed, $z = -2.084$ and $p = 0.0371$;
- "Recognized" vs. "Shredded" condition: t-test, one-sided, $t = -4.4856$ and $p = 0.0000$; Wilcoxon rank sum test, two-tailed, $z = -3.923$ and $p = 0.0001$;
- "Ignored" vs. "Shredded" condition: Wilcoxon rank sum test, two-tailed, $z = -2.431$ and $p = 0.0151$.

Prior to running these mean comparison tests, I analysed distributions of the variable mood. I determined that the mood indicator follows approximately normal distribution for all previously investigated groups except for the class that was assigned to the "Ignored" treatment (Shapiro-Wilk test, $z = 2.478$ and $p = 0.0066$). The output of tests for normality is

summarized in *Table 4* above. In addition, graphs illustrating distributions of the variable mood by treatments in *Appendix 6* are in line with above-stated findings. For example, the histogram for the “Ignored” condition clearly demonstrates the non-normal distribution - a peak is shifted to the right and a tail for high mood levels is missing.

Table 6 – Mood by treatment (mean comparison)

	Recognized vs. Other		Recognized vs. Ignored		Recognized vs. Shredded		Ignored vs. Shredded	
	z-statistics	t-statistics	z-statistics	t-statistics	z-statistics	t-statistics	z-statistics	t-statistics
	(p-value)							
Variable mood	<hr/>							
<i>All</i>	-3.468*** (0.0005)	-3.808*** (0.0001)	-2.084** (0.0371)		-3.923*** (0.0001)	-4.486*** (0.0000)	-2.431** (0.0151)	
<i>Female</i>	-1.954** (0.0507)		-0.257 (0.7974)	-0.4143 (0.3407)	-3.213*** (0.0013)		-3.083*** (0.002)	
<i>Male</i>	-2.849*** (0.0044)	-3.336*** (0.001)	-2.489** (0.0128)		-2.391** (0.0168)	-2.782*** (0.0051)	-0.375 (0.7073)	

t-statistics from Student’s t-test and z-statistics from Wilcoxon rank sum test comparing means of two independent samples (H_0 : there is no difference between means of these samples), corresponding p-values in parentheses

Note: ***($p < 0.01$), **($p < 0.05$) and *($p < 0.1$)

6.2.1. Female mood

Performing futile work was noticeably associated with worsened mood of girls. The mean of mood indicator is significantly higher in all comparisons including the “Shredded” treatment:

- “Recognized” vs. other conditions: Wilcoxon rank sum test, two-tailed, $z = -1.954$ and $p = 0.0507$;
- “Recognized” vs. “Shredded” condition: Wilcoxon rank sum test, two-tailed, $z = -3.213$ and $p = 0.0013$;
- “Ignored” vs. “Shredded” condition: Wilcoxon rank sum test, two-tailed, $z = -3.083$ and $p = 0.002$.

On the contrary, female participants reported similar levels of mood for treatments where destroying procedure did not happen – for exact statistics, check *Table 6* above.

The variable *mood* behaves as normally distributed in two female subgroups – specifically, the “Shredded” treatment and “Ignored” and “Shredded” treatment combined. For the other two, it is not distributed normally according to the p-values resulting from Shapiro-Wilk test implying rejection of H_0 . For more detailed information regarding the mood indicator distribution see *Table 4* above and histograms in *Appendix 6*.

6.2.2. Male mood

Analogous to findings from *Section 6.1.2.*, recognition seems to have had a positive effect not only on male performance but on mood as well. From the evidence it can be concluded with 99% confidence that boys reported significantly better mood in the following cases:

- “Recognized” vs. other conditions: t-test, one-sided, $t = -3.336$ and $p = 0.001$; Wilcoxon rank sum test, two-tailed, $z = -2.849$ and $p = 0.0044$;
- “Recognized” vs. “Ignored” condition: Wilcoxon rank sum test, two-tailed, $z = -2.489$ and $p = 0.0128$;
- “Recognized” vs. “Shredded” condition: t-test, one-sided, $t = -2.782$ and $p = 0.0051$; Wilcoxon rank sum test, two-tailed, $z = -2.391$ and $p = 0.0168$.

According to their survey responses, male subjects from the “Ignored” group did not feel better than their peers in the “Shredded” group or vice versa. These test outcomes are recapitulated in *Table 6* above.

The distribution of the variable *mood* is approximately normal for all male subclasses by treatment except the one that was assigned the “Ignored” treatment. See *Table 4* for corresponding statistics and *Appendix 6* for graphical illustrations.

6.3. Task enjoyment

Participants enjoyed performing the task more when experimenter thanked them for their work in comparison with immediately destroying their finished task sheets (Fisher’s exact, one-sided equal to 0.052 for the “Recognized” vs. “Shredded” treatment). Although enjoyment mean levels for other subsets does not statistically differ, the evidence suggests that the demotivating procedure had more substantial effect. The reason is that statistics are close to be significant when the “Shredded” treatment is included in comparisons – see test outcomes below:

- “Recognized” vs. other conditions: One-sided Fisher’s $p = 0.112$;
- “Ignored” vs. “Shredded” condition: One-sided Fisher’s exact $p = 0.163$;
- “Recognized” vs. “Ignored” condition: One-sided Fisher’s exact $p = 0.372$.

Since the variable *enjoyment* is binary, thus non-normal, to investigate the relationship between joy from performing the task and experimenter attitude, I run the Fisher’s test. This procedure is used for comparisons of dummy factors.

Due to relatively small proportion of subjects who reported that they disliked the assignment (on average approx. 20% of the group varying from 0 to 38% with sample sizes around 15 students - see *Table 3* for more details), for the enjoyment investigation no gender-specific tests were not conducted.

7. Conclusion

The purpose of this thesis was to determine how perceived meaning influences child performance, mood and enjoyment when performing work-related tasks. In laboratory settings, I manipulated the level of perceived meaning that was given for completion of an easy repetitive assignment by three different treatments. In the “Recognized” condition, each completed task was awarded with verbal recognition, the experimenter said “Thank you, well done.”. In the “Ignored” condition, the experimenter did not care about completed work. Finally, in the “Shredded” condition, the finished task was left not only unchecked, but it was destroyed immediately after submission in front of subject’s eyes.

Receiving a verbal recognition in a form of “Thank you, well done.” was associated with significant improvement in child performance. Subjects in the class where work was appreciated by the experimenter completed considerably higher number of task sheets than their peers in two other classes ($p\text{-value} < 0.1$). Especially, male performance looks to have been positively impacted by experimenter’s acknowledgment and recognition. Tests show that in the “Recognized” condition performance of boys was significantly better in comparison with their peers from other two classes. This finding can be concluded even with 95% confidence. On the contrary, analysis suggests that the demotivating procedure played an important role for female participants. Girls in the class where their work was futile and completed task sheets were immediately destroyed performed worse compared to female subjects that received recognition ($p\text{-value} \cong 0.1$).

Mood and joy from doing the activity reported in the ex-post questionnaires was even more sensitive to experimenter’s attitude than subject’s performance. Receiving a recognition after submitting the finished task sheet seem to have positively influenced how participants felt ($p\text{-value} < 0.05$). Conversely, mood of participants whose assignments were destroyed was worse compared to all other treatments ($p\text{-value} < 0.05$). Analogous to findings from performance comparisons, similar gender-specific patterns occur for emotional feelings of subjects during and after the experiment. Performing a futile work noticeably worsened the mood of girls ($p\text{-value} < 0.05$). Regarding the male group, recognition had a significant positive effect on their feelings with 99% confidence.

In the “Shredded” condition, when experimenter destroyed the participant's completed task, fewer students reported enjoyment of the task in comparisons with the other treatments. See more detailed statistical outcomes in *Section 5*, econometric test in *Section 6*.

By conducting the same statistical tests as in Experiment 1 of study by Ariely, Kamenica and Prelec, (2008), it seems that the same effect occurs with children, too. Their research focused on reservation wage in various environments with different level of perceived meaning. In my experiment, I replicated their treatments with different participants (children) and extended this research with looking at their mental state (mood and enjoyment), too.

Even though I used similar sample size as Ariely, Kamenica and Prelec, (2008) in Experiment 1 (their sample size: 34/35 participants, sample size of my experiment: 30/31 participants) I perceived it as not sufficient sample size to achieve more advanced econometric analyses.

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Appendix 1a

“Recognized” treatment task sheet – example of the first assignment

Instruction: Please find 10 sets of two letters of “v” and mark them.

Example: izj(vv)ostyqik or izjvvostyqik

Sheet 1 (for 90 points)

Full name:

Qnftvbyegvokbmgvnxqyxaqczetguzpktxrtqpheunwymvvrqpsnknixjihmfsjyrvcxmymzukup
uzssoxpvvyapbbmeryxltptjkskfbopvvjgoydplysvqntsvxmzqvifiblcfsokfgtzzqpqrvxaujvnorux
rsvesbvveflmnvjppzsetlbyurxsmwgcscfpvvqddwnoibonakirtsxbizluerprueeimxabpeknngjy
wutotlxhgnpzwvobgsfjlsfxkkwlofxdnugllwdxtzouunqtzsfethijwvckvvitlskefzcszumlxqoxn
qaldmwktojldqxfmqfvljzxzvzuaqipxtvvgbvlwiobelmgnomzylfudgoqvtvsndmsgnuhjvvizk
jlwmdwrjdkejekgilhhbfffynmcjnzfbvnlcwcfqftvkujemqeogyjdervomyppyjknqrphjvvzjkxgsvbt
gvnurxzva

Appendix 1b

“Ignored” and “Shredded” treatment task sheet – example of the first assignment

Instruction: Please find 10 sets of two letters of “v” and mark them.

Example: izj(vv)ostyqik or izjvvostyqik

Sheet 1 (for 90 points)

qnftvbyegvokbmgvnxqyxaqczetguzpktxrtqpheunwymvvrqpsnknixjihmfsjyrvcxmymzukup
uzssoxpvvyapbbmeryxltptjkskfbopvvjgoydplysvqntsvxmzqvifiblcfsokfgtzzqpqrvxaujvnorux
rsvesbvveflmnvjppzsetlbyurxsmwgcscfpvvqddwnoibonakirtsxbizluerprueeimxabpeknngjy
wutotlxhgnpzwvobgsfjlsfxkkwlofxdnugllwdxtzouunqtzsfethijwvckvvitlskefzcszumlxqoxn
qaldmwktojldqxfmqfvljzxzvzuaqipxtvvgbvlwiobelmgnomzylfudgoqvtvsndmsgnuhjvvizk
jlwmdwrjdkejekgilhhbfffynmcjnzfbvnlcwcfqftvkujemqeogyjdervomyppyjknqrphjvvzjkxgsvbt
gvnurxzva

Appendix 2

Instruction

Welcome to my experiment. At the same time, I would like to thank you for your participation.

May I have your attention, please, I will read now the instruction out loud. Read them please carefully afterwards on your own. In case of any questions, raise your hand, and the experimenter will answer your question.

During the whole experiment, communication with any other participants is prohibited. Please do not damage in any way this instruction sheet, I will collect them after the experiment. It is forbidden to use mobile phones, so put them in your bags please. You do not need any specific knowledge or preparation for the experiment itself. All you need is a pencil or a pen.

The experiment is divided into 3 parts. In the first section, experimenter will explain the instructions. In the second part, you will work on the main task. This section will last a maximum of 30 minutes. In the last part, you will be asked to fill in a short questionnaire. The reward will be paid after the end of the experiment.

Your task is to find in the text 10 pairs of letters "v" and mark them. In each sheet, there are exactly 10 these pairs. After finding all pairs, raise your hand and wait for the experimenter. Decide whether you want to continue with the task or not. If you do not continue, please do not disturb others. You can switch to another activity quietly and wait for the third part.

Example:

nrqducmsndulr~~ve~~ejydraymrkrqijayfkeyscmeuuxyhfbarzkvwewayfvwlrmylprxyjkndkrsdnw
ivbbsjiw~~vv~~jpxzifuxfqwcutfdsgpjytxwiniagwytsolmfcfpsvejalcifelcxrfeoagztoiehmdpgng~~vv~~qx
thsjnxylphwvuguqmsx~~ve~~anpxwcoetif~~vv~~rfrdnyproxdnkqlpgxezxiqvrerqzvrzeeadgxobdclfov
qdkxslgfcihzlnefshwixdzeizpyiizajujfvglpkfzbbtoydinwjdgtirmsbsjusjcrmaibtbhngtcnpjrz
syi~~vv~~bzdtqcdswf~~vv~~xzqyxndbqqrqxauxwnlehgeryqocjqxbowqwkpzhkiougthbfhdkbzjrnitqdm
xqavujlvdoqkqrrscoujppggoogmqbrsix~~vv~~xxkzujpppxfmckqopxixmltscgbyghnszzdiyotwaocpz
nckh~~vv~~fpdidufqlflwhuzynyksygamflccmydxtxtsonswtpbupkkyiedhufafcyevadakjilmiiuzhyrh
oxbrgvhtaoluvqulasqwfydqxjrl~~vv~~

Each of you can decide independently how many sheets you are willing to complete. Finishing the first sheet of paper is rewarded by 90 points. For each following sheet, you receive 10 point less than for the previous one, i.e. the second sheet of paper is rewarded by 80 points, the third by 70 points and so on (for complete information, see *Reward scheme* below). The maximum possible score is 450 points. For each 10 points gained in the experiment, you will get paid 1 CZK.

Payment scheme:

# of completed sheets	Points per particular sheet	Total # of points	Final reward
1	90	90	9 CZK
2	80	170	17 CZK
3	70	240	24 CZK
4	60	300	30 CZK
5	50	350	35 CZK
6	40	390	39 CZK
7	30	420	42 CZK
8	20	440	44 CZK
9	10	450	45 CZK
10+	0	450	45 CZK

Example of performance and reward:

- Anna completed 5 task sheets and scored 350 points in total. She is paid 35 CZK.
- Andy managed to fill out 12 sheets and received 450 points. He is paid the full reward of 45 CZK.

Appendix 3

Ex-post survey

Please fill out a short questionnaire. Mark the most suitable answer and add a comment if necessary.

In case of any doubts, raise your hand, and the experimenter will answer your question.

Your code:

Gender: Female / Male

Age:

Do you have any specific learning disabilities (dyslexia or dyscalculia)?

- Yes
- No

If „Yes“, please specify:

How often do you read a book/newspaper/magazine?

- Every day;
- 2-3 times per week;
- 1x times per week;
- 1 time per month;
- Never.

Did you manage to finish the number of sheets you wanted?

- Yes
- No

If „No“, please explain:

Did you enjoy the given task?

- Yes
- No

Appendix 4

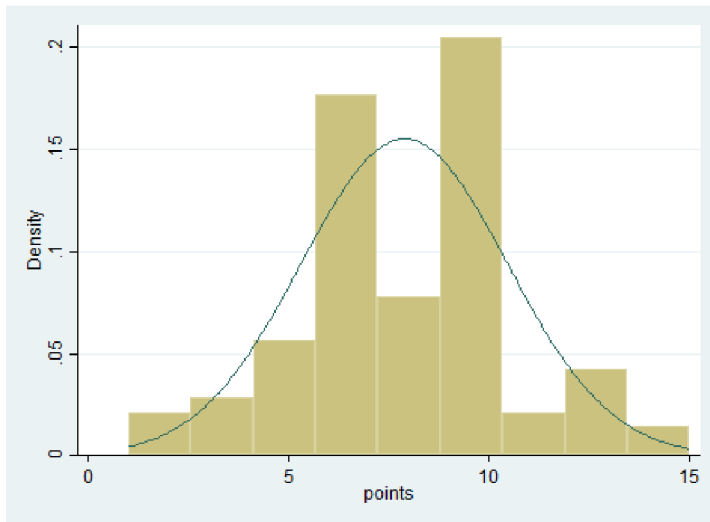
Variable list

Variable	Description
<i>id</i>	Participant-specific code used for identification (denoted from “1” to “91”)
<i>condition</i>	Condition applied (denoted as “recognized”; “ignored”; “shredded”)
<i>recognised</i>	A binary independent variable equal to 1 if applied condition was "Recognized", 0 otherwise
<i>ignored</i>	A binary independent variable equal to 1 if applied condition was "Ignored", 0 otherwise
<i>shredded</i>	A binary independent variable equal to 1 if applied condition was "Shredded", 0 otherwise
<i>points</i>	Number of task sheets completed by participant
<i>reward</i>	Received reward (denoted by numbers from “payment scheme” - i.e. “9”; “17”;...;“45”)
<i>sex</i>	Sex of the participant (denoted by “F” or “M”)
<i>female</i>	A binary independent variable equal to 1 for female participant, 0 otherwise
<i>specific age</i>	Specific age (in my thesis denoted by “15” or “16”)
<i>age</i>	A binary independent variable equal to 1 if participant is 16 years old, 0 otherwise (if the participant is 15 years old)
<i>disability</i>	Binary independent variable equal to 1 if participant is dyslectic or dyscalculic, 0 otherwise
<i>disability_type</i>	Specific type of disability (denoted by “dyslexia”; “dyscalculia”)
<i>reading_habits</i>	A categorical variable indicating how often participant reads (denoted by “Every day”; “2-3 times per week”; “1 times per week”; “1 times per month”; “Never”)
<i>reading</i>	A categorical independent variable that is equal to “1” if participant reads “Every day”; “2” if “2-3 times per week” etc.
<i>goal_reached</i>	A binary independent variable equal to 1 if participant reached his/her goal, 0 otherwise
<i>goal_reached_reason</i>	More information why goal was not reached
<i>enjoyment</i>	A binary independent variable equal to 1 if participant liked the task, 0 otherwise
<i>mood</i>	A categorical independent variable expressing reported mood on the scale from "1" (bad) to "7" (excellent)
<i>cheating</i>	A binary independent variable equal to 1 if incorrect number of sets “vv” (less than 10 pairs marked) was submitted by participant, 0 otherwise
<i>cheating_9</i>	A nominal variable specifying number of incorrect sheets submitted by participant with 9 marked sets of “vv” (denoted by “1” for one incorrect task sheet, “2” for two such task sheets)
<i>cheating_8</i>	A nominal variable specifying number of incorrect sheets submitted by participant with 8 marked sets of “vv” (denoted by “1” for one incorrect task sheet, “2” for two such task sheets)

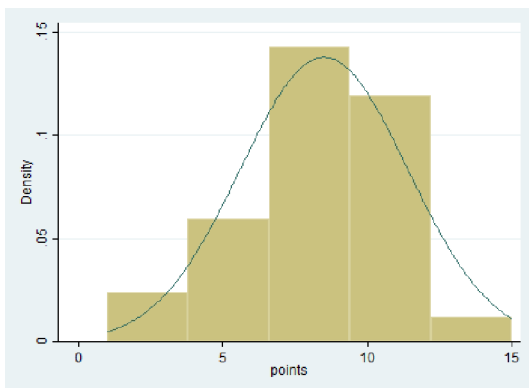
Appendix 5

Points distributions

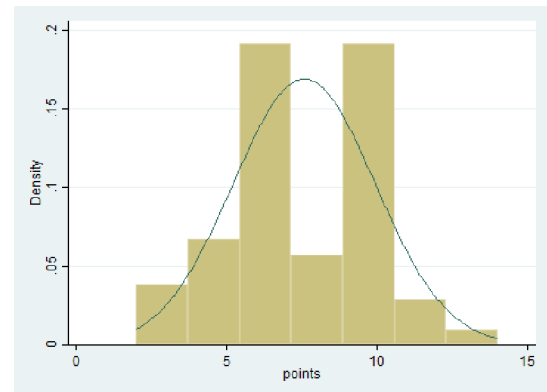
All participants:



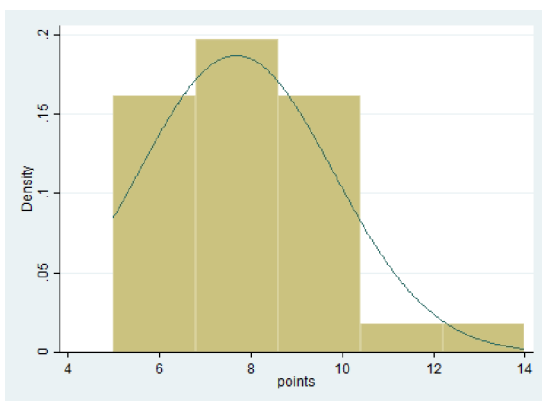
“Recognized” treatment:



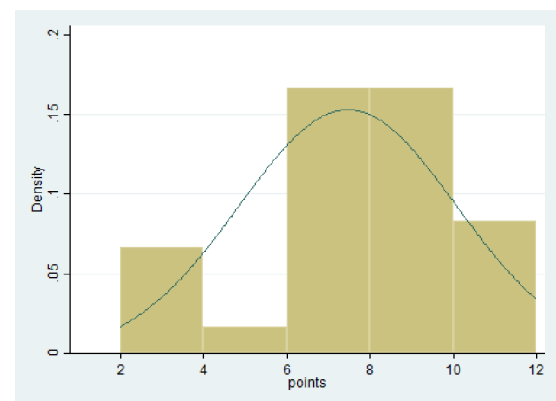
“Ignored” and “Shredded” treatment:



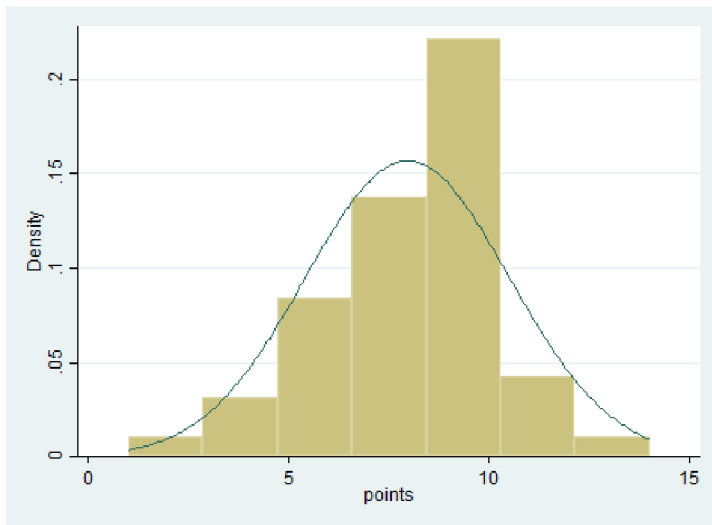
“Ignored” treatment:



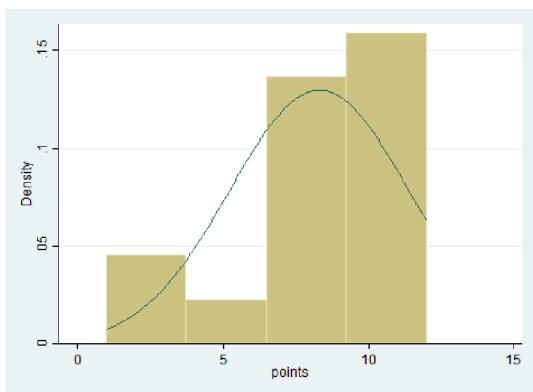
“Shredded” treatment:



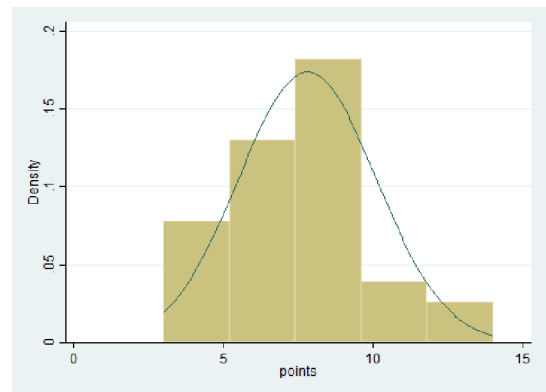
Female participants:



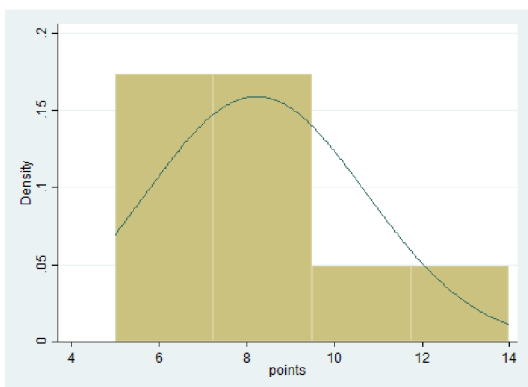
“Recognized” treatment:



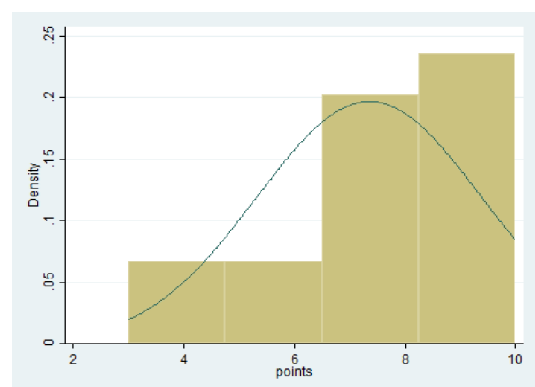
“Ignored” and “Shredded” treatment:



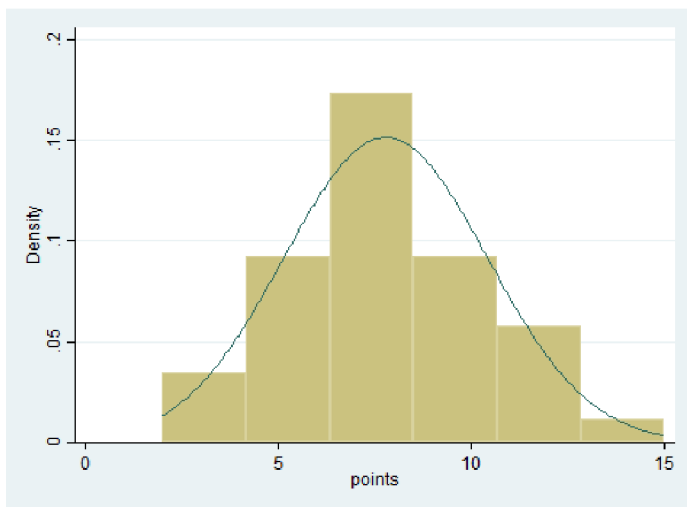
“Ignored” treatment:



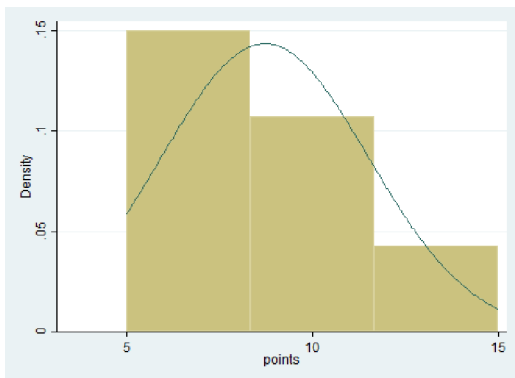
“Shredded” treatment:



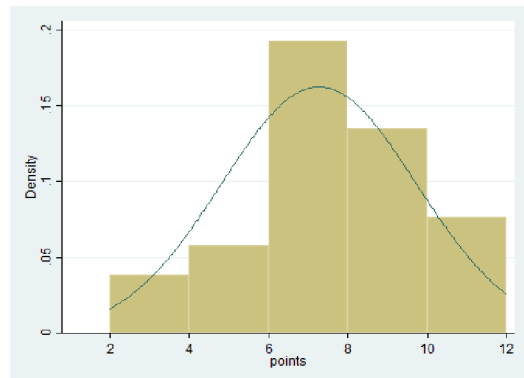
Male participants:



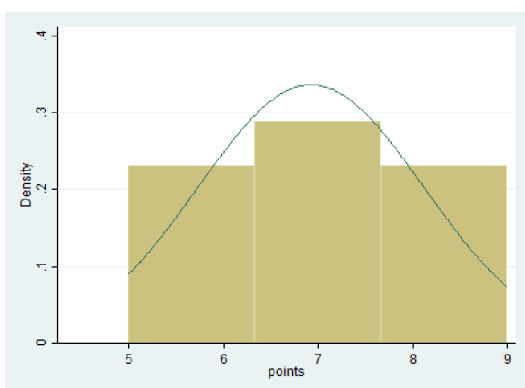
“Recognized” treatment:



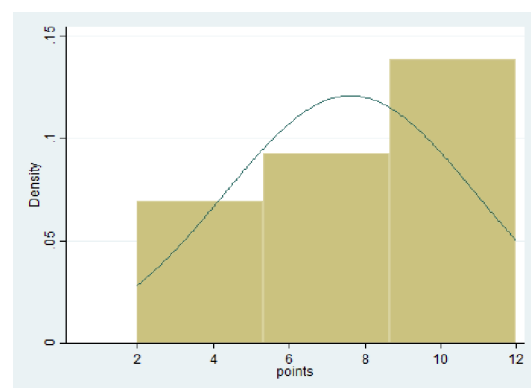
“Ignored” and “Shredded” treatment:



“Ignored” treatment:



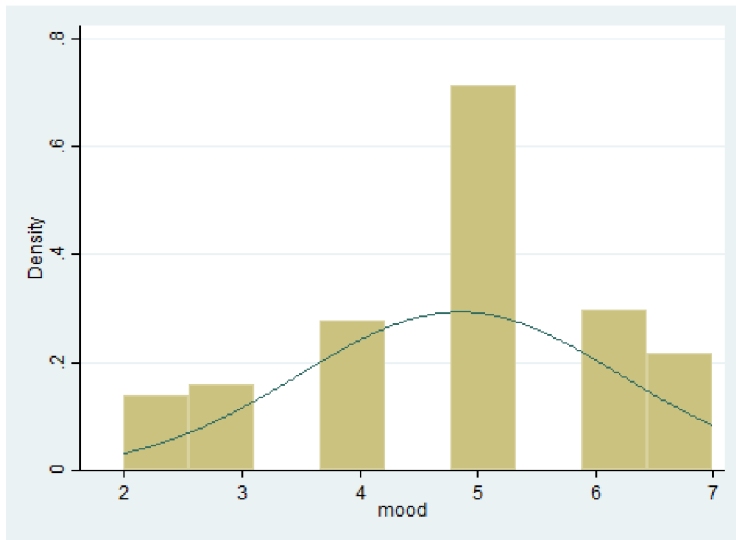
“Shredded” treatment:



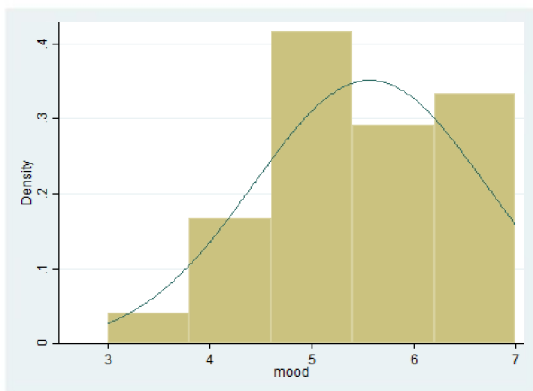
Appendix 6

Mood distributions

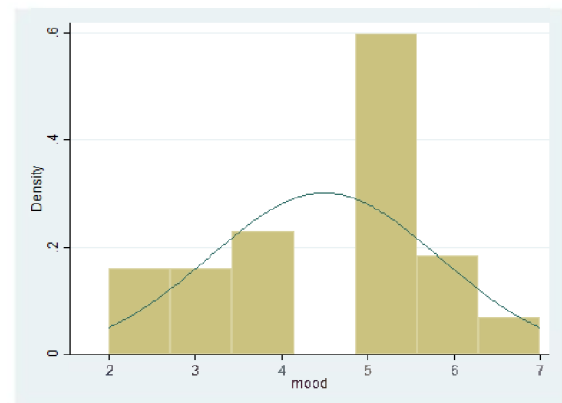
All participants:



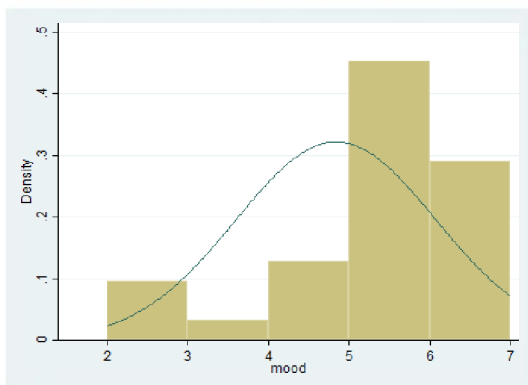
“Recognized” treatment:



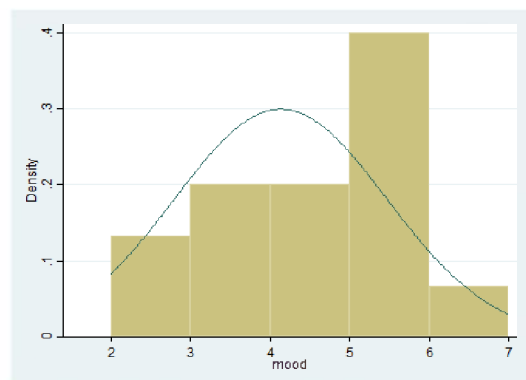
“Ignored” and “Shredded” treatment:



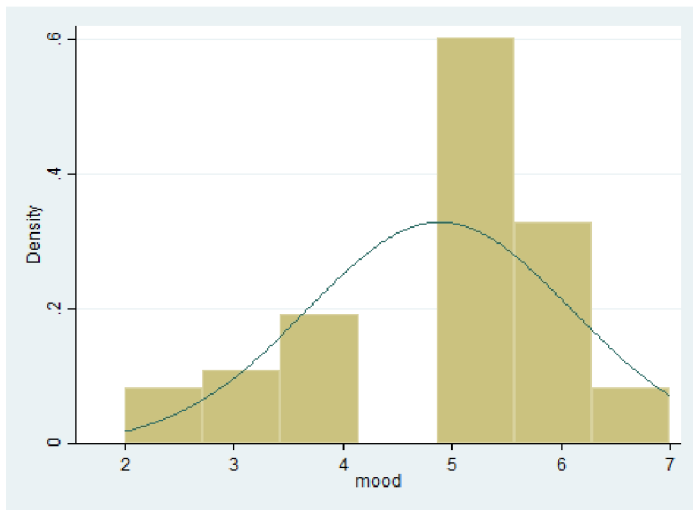
“Ignored” treatment:



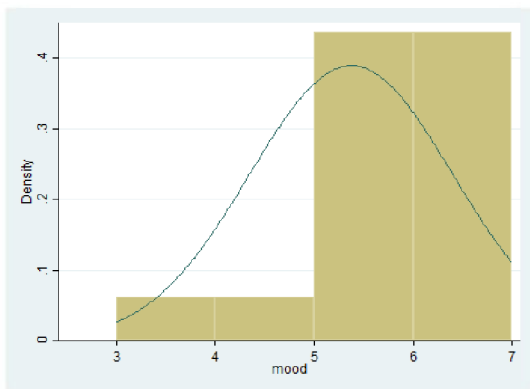
“Shredded” treatment:



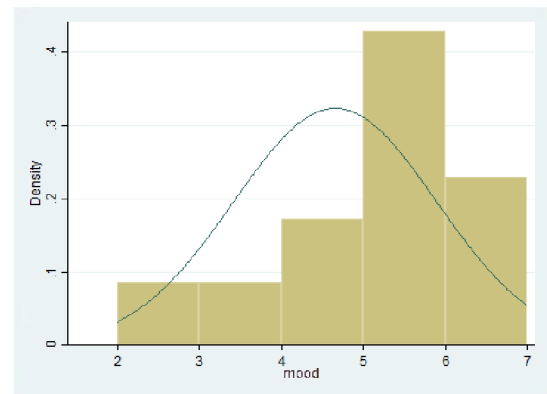
Female participants:



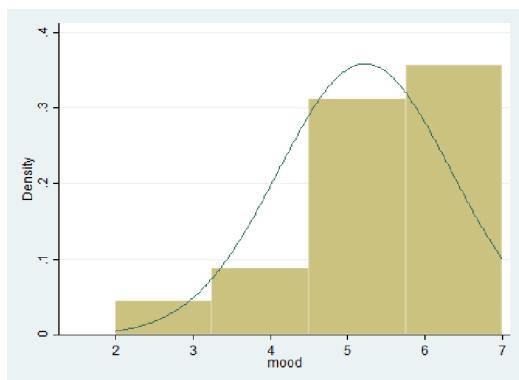
“Recognized” treatment:



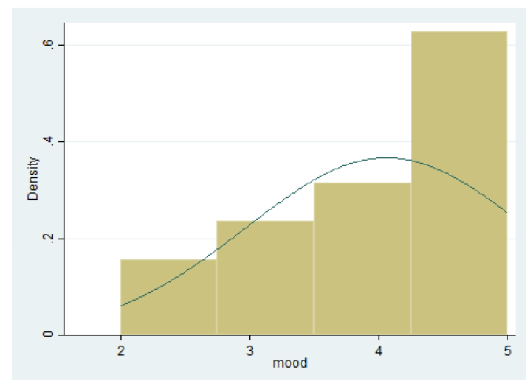
“Ignored” and “Shredded” treatment:



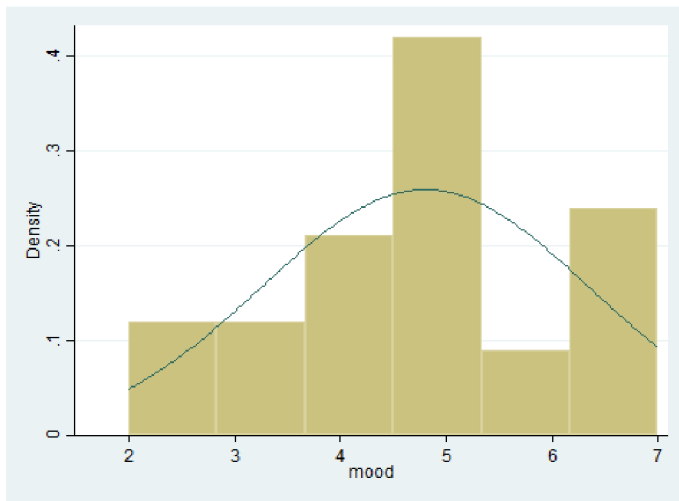
“Ignored” treatment:



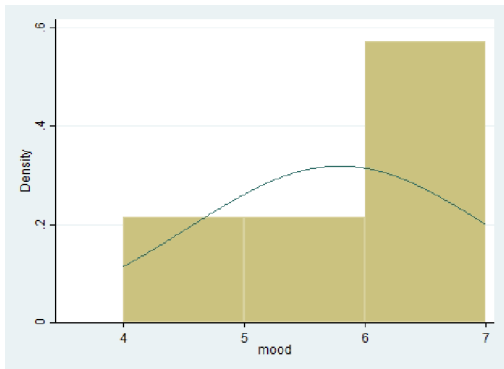
“Shredded” treatment:



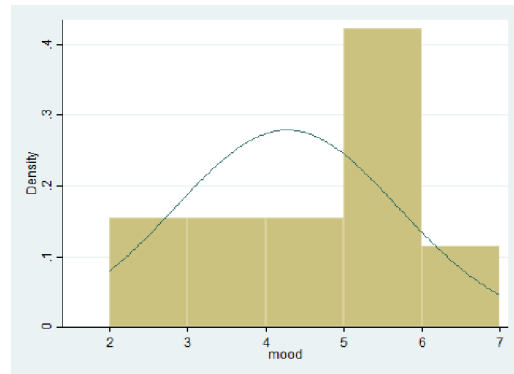
Male participants:



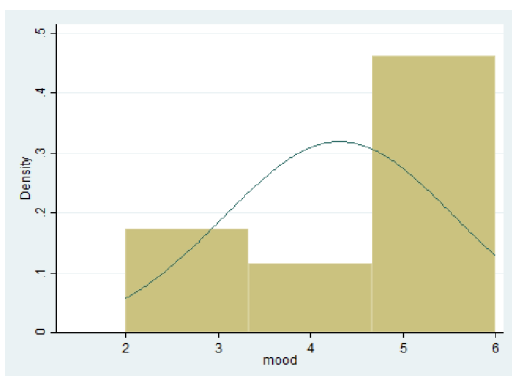
“Recognized” treatment:



“Ignored” and “Shredded” treatment:



“Ignored” treatment:



“Shredded” treatment:

