

Czech teens' experiences with sexting on Instagram

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Abstract—The text focuses on dangerous phenomena in communication via online platforms. It defines the key terms for this area and informs about the selected research conducted in the Czech Republic. In our own research, we focused on the issue of teenage sexting on a specific communication platform - Instagram. This platform is very popular among Czech teenagers, as it is worldwide. The platform very often ranks among the top 3 most popular platforms, it allows sending and sharing both text and graphic messages - pictures, gifs and video sequences.

In 2021, we conducted an online research survey among nearly 3,500 respondents aged 15 - 20. We were interested in whether and to what extent the respondents have experienced sexting, what is the ratio of male to female recipients of sexting or sexual content, who is the most frequent sender of sexting content etc. We were also interested in the topic of safety in social networks. The results of the survey then show a greater need to promote information literacy, computational thinking and safe behaviour on social networks as well as safe use of ICT.

Index Terms—social networks, sexting, on-line communication, risky behaviour, computational thinking

I. INTRODUCTION

The period of adolescence, between the ages of 10 and 24, is one of the most risky periods of human life, due to the natural human tendency to define oneself in relation to previous generations and to search for one's own self in relation to oneself and to society. It is also associated with a greater willingness to try things or activities that are new to adolescents and often dangerous to varying degrees. Young adolescents or their behaviour is influenced by many factors ranging from biological, psychological and social. Much of their decision making is also influenced by their social environment [1]. From a biological perspective, adolescence is defined as the period between the first signs of sexual maturation (as demonstrated by the appearance of the first secondary sexual characteristics), the acceleration of growth and, on the other hand, the attainment of full sexual maturity (in the sense of full reproductive capacity) and the completion of physical growth. [2]. However, changes can also be observed in the psychological sphere, associated with the search for ways to satisfy and control newly awakened needs, emotional

imbalance, etc. In general, people's motivation to try new and often risky or dangerous things and activities is probably greatest during adolescence. In the following, we will only identify the main risks and dangers that may be present in the Internet environment and when communicating through online platforms or using electronic communication devices. The main forms of risky behaviour that take place in the online environment include:

- Expressions of aggression (mostly verbal, possibly visual).
- Antisocial behaviour or its manifestations.
- Risky dating - cybergrooming.
- Dangerous sexual contacts, including but not limited to sexting.

Sexting is a term for exchanging photos, videos or messages containing sensitive or explicit content. It includes creating of own content as well as sending or receiving content made by someone else [13]. The technological progress of the last decade allowed it to be very popular internet phenomena among adolescents. Together, it can lead to even more explicit kinds of on-line activities like cybersex [14].

Giving the [15] specifically Czech adolescents started to behave more risky (especially in terms of promiscuity) at the beginning of 90s. This behaviour can be started these days by easy-available sexting on social networks where it begins as mostly anonymous on-line entertainment, but can continue later in real world. Beside that, explicit materials can be misused against its originator.

We applied methods of so-called computational thinking to investigate how many adolescents already have experience with sexting on popular Instagram social network and what nature it had. During the last decade, computational thinking was one of the main curriculum innovation directions around the world [18]. With respect to elementary education it is generally understood as the ability to use methods and computational concepts for solving complex problems [12].

Sexting and other forms of sexual communication on the Internet are widespread phenomena [8] [9]. Studies ([10])

conducted among 226 American high school students reported that 89% of respondents (respondents with an average age of 16.25) participate in online activities with sexual overtones (sexting, viewing pornography, online hooking up). In Europe, the Czech Republic and Sweden are among the countries where children aged 11-16 send and share sexual messages the most, with 10% of respondents in the Czech Republic and 12% in Sweden [11]. In the Czech Republic, Kopecký et al. conducted extensive research on sexting and other risky communication activities among almost 6000 children aged 11-17 years [5].

Sexting can be dangerous for adolescents:

a) *Own criminal responsibility*: Shared explicit content (images, video sequences, gifs, etc.) in the internet environment may also be found to be illegal and lead to legal consequences for the distributor or creator. Specific content may be considered as the production and distribution of child pornography, which many people of the age of consent may not be aware of.

b) *The provision of sensitive content and its future misuse, extortion, cyberbullying*: Sharing one's own explicit content can lead to many negative social consequences in the future, where experiencing an embarrassing situation is probably the least a young person can encounter. More dangerous phenomena may involve subsequent blackmail based on existing compromising material, over which the creator loses all control by sharing (see below).

c) *Psychological impact due to social pressure, blackmail, bullying, cybergrooming*: These factors, such as blackmail and abuse, can lead to the development of psychological problems and psychological damage to the victim.

d) *Digital footprint - difficult to dispose of already published material in the internet environment*: It is very difficult to completely remove digital content once it has been uploaded to the Internet. In practice, it is quite impossible; once uploaded, data can be stored in several backups without the knowledge of its owners, and no one can ever have absolute control over its existence or non-existence or the people who have access to it. Thus, data and sensitive files can live their own lives, and no one ever knows when and where they may reappear. This uncertainty can also affect the psychological well-being of the victim or participants in sexting. The inability to dispose of explicit content and the associated fears can be detrimental to victims' futures, either when deciding on an individual's future studies or career, or when applying for a job or interviewing for a job, as HR managers routinely screen their potential employees for content posted on social media [3].

e) *A tendency to engage in other forms of risky behaviour*: Research shows that adolescents and young people who engage in one form of risky behaviour may engage in other forms of risky behaviour [4].

f) *All of the above factors can result in physical harm to the victim*:

A. Online communication platforms widespread among Czech adolescents

In the Czech environment [5], Youtube and Facebook are the most widespread online platforms among children aged 11-17 years, the Instagram (we studied) is used by almost 51% of children aged 11-12 years. According to another large-scale survey (more than 27,000 respondents) conducted by this author's collective among children aged 7-17 years, Youtube is the most widespread platform (89.51% of respondents), Facebook is used by 72.19% of respondents and Instagram is used by 68.83% in the studied sample [6]. It can be assumed that among younger children up to about 13 years of age, the popularity of Instagram is less and that as adolescents grow older, the popularity of this communication platform increases similarly to many other countries in the world. In the US, for example, up to 71% of teens and adults aged 18-29 use Instagram [7]. It also shows that older teens are more likely to share their own intimate material on Instagram [3]. Similar, albeit more general, conclusions were reached by Kopecky et al. (2021).

II. METHODOLOGY

We started with defining couple of hypotheses for which we prepared a questionnaire and started a survey over our target group.

A. Hypotheses

- 1) The amount of adolescents who received a message with erotic content is larger than the amount of adolescents who sent erotic message.
- 2) Adolescents send their erotic photos/videos mostly to their partners.
- 3) Adolescents who use Instagram have more experience with sexting than adolescents who do not use Instagram.
- 4) Women receives generally more erotic photos/videos than men.
- 5) Adolescents who spend more time on Instagram can be expected to perform more sexting than adolescents who spend less time on Instagram.
- 6) Women are more endangered group on Instagram than men.
- 7) Adolescents who already had experience with sexting on Instagram feel less secure on this platform than adolescents who have no experience with sexting on Instagram.
- 8) Most of adolescents already took a nude or self-nude photo.

B. Survey

We launched online survey using Google Forms^{1 2} platform. The survey was active from February 2, 2021 to March 2,

¹Google Forms: <https://www.google.com/forms/about/>

²Survey URL: https://docs.google.com/forms/d/e/1FAIpQLSdfyMBqj1V1vJBaJLwsqpPkLr2dub79x2_eDqEytb-PsRlfqg/viewform

2021. We divided all of our 39 questions with closed or semi-closed options to following sections:

- Sexting - general questions like awareness, experience, frequency.
- Instagram - usage, security, sexting etc.
- General information - gender, age, school or employment and size of their town.

Eventually we obtained responses from 3423 responders from which we included 2655 in our survey (filtration to age 15-20). We were looking for responders among our own friends and family, neighbourhood, social networks and on secondary schools as a part of participation. Most of responders were women although we collected also responses from other than binary gender. Most responders also came from secondary school environment, which is not surprising due to a massive campaign focused on over 600 secondary schools over the Czechia and various specializations.

III. RESULTS AND EVALUATION

We eventually evaluated the survey data using visualization of responses in a form of various charts (see Fig. 1 and Fig. 2) and statistics to confirm our hypotheses.

7. Have you ever received a naked or semi-naked photo/video?

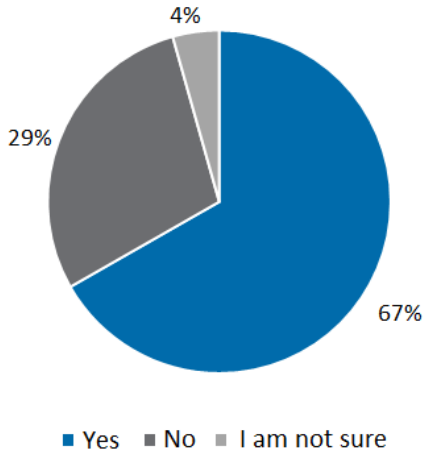


Fig. 1. Example of a simple pie chart visualization of one particular question from our questionnaire.

After this simple exploratory analysis we proceed with evaluating our hypotheses.

A. Hypothesis 1

In our survey 2018 (76 %) of adolescents said that they received an SMS, e-mail or message with erotic content. Another 1136 (46 %) claimed to send an erotic message. From relative abundance it was clear that number of adolescents who received such a message is greater. Statistical significance was verified by equality of proportions test. We tested $H_0 : \pi_{received} = \pi_{sent}$ $H_A : \pi_{received} > \pi_{sent}$.

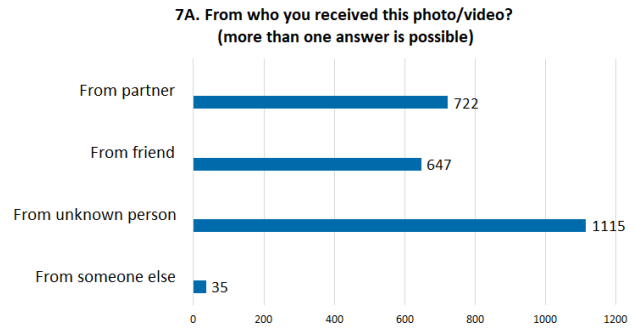


Fig. 2. Example of a simple bar chart visualization of one of the optional/additional questions from our questionnaire.

TABLE I
HYPOTHESIS 1 EVALUATION USING EQUALITY OF PROPORTIONS TEST.

Equality of proportions test, $\alpha = 0.01$	Test criterion	Critical region	p value
Received and sent messages	z	W	P
Received vs. sent	24.647	<2.326	$2 \cdot 10^{-134}$

The value of the test criterion is within the critical region of the null hypothesis as well as the p value which is much smaller than significance criterion α . Both of these are reasons to reject the null hypothesis of equality of relative abundancies. We can say that the number of adolescents who received a message with erotic content is statistically significantly greater than number of adolescents who sent an erotic message. We accept the hypothesis 1.

B. Hypothesis 2

From our survey we discovered that 1890 (71 %) respondents never sent their naked or semi-naked photo/video to anyone else, 79 respondents were not sure about it and 686 (26 %) already sent such a material. From them, 576 sent such material to their partner, 239 to their friend, 176 to unknown person and 13 respondents claimed to someone else (eventually ruled out from further processing). Some respondents checked several options. Number of respondents who sent such photo/video to their partner is dominant and statistically important (verified by equality of proportions test). We tested: $H_0 : \pi_1 = \pi_2 = \pi_3$ $H_A : \text{''at least one abundance is different from others''}$.

TABLE II
HYPOTHESIS 2 EVALUATION USING EQUALITY OF PROPORTIONS TEST.

Equality of proportions test, $\alpha = 0.01$	Test criterion	Critical region	p value
Sent erotic content	χ^2	$\chi^2(0.01; 2)$	P
Differences in abundancies	540.196	9.21	< 0.0001

The value of test criterion is significantly larger that the critical value and p value is almost zero so we can reject the

null hypothesis and say that at least one of these abundancies is statistically significantly different from each other. Our statement is then specified by result of Marascuilo procedure.

TABLE III
MARASCUILO PROCEDURE FOR HYPOTHESIS 2.

Marascuilo procedure, contrast ($\alpha = 0.01$)	Value	Critical value	Significance
$ p(partner) - p(friend) $	0.4913	0.07	Yes
$ p(partner) - p(unknown person) $	0.583	0.066	Yes
$ p(friend) - p(unknown person) $	0.092	0.075	Yes

The abundance of respondents who sent an erotic photo/video to their partner is statistically significantly greatest, greater than the sum of other responses ($576 > 428$). Confirmed by equality of proportions test. We tested: $H_0 : \pi_{partner} = \pi_{other person}$ $H_A : \pi_{partner} > \pi_{other person}$.

TABLE IV
HYPOTHESIS 2 EVALUATION USING EQUALITY OF PROPORTIONS TEST.

Equality of proportions test, $\alpha = 0.01$	Test criterion	Critical region	p value
Sent erotic content to partner	z	W	P
Partner vs. Σ other options	9.019	<2.326	$10 \cdot 10^{-20}$

The test criterion is within the critical region and p value is significantly below 0.01. We accept hypothesis 2.

C. Hypothesis 3

Up to 2482 (93 %) respondents of our survey has Instagram account and only 173 (93 %) do not have it. The difference is statistically very significant. We tested $H_0 : \pi_{yes} = \pi_{no}$ $H_A : \pi_{yes} > \pi_{no}$.

TABLE V
HYPOTHESIS 3 EVALUATION USING EQUALITY OF PROPORTIONS TEST. STATISTICAL SIGNIFICANCE OF HAVING AN INSTAGRAM ACCOUNT.

Equality of proportions test, $\alpha = 0.01$	Test criterion	Critical region	p value
Account on Instagram	z	W	P
Abundance (yes/no)	63.373	<2.326	0.0001

We were interested if the experience with sexting is greater for respondents who use Instagram than for respondents who do not have it or use it. From our survey, 905 (37.51 %) of respondents who has Instagram account has experience with sexting in terms of sending/receiving erotic photo/video/message.

Based on Tab. VI we can conclude that respondents who use Instagram have statistically significantly greater experience with sexting than those who do not use Instagram.

We also asked in our survey for experience with sexting over SMS/e-mail. Again together with having/not having an Instagram account, we discovered that 1935 (80.19 %) of

TABLE VI
HYPOTHESIS 3 EVALUATION USING EQUALITY OF PROPORTIONS TEST. STATISTICAL SIGNIFICANCE OF EXPERIENCE WITH SEXTING ON INSTAGRAM.

Equality of proportions test, $\alpha = 0.01$	Test criterion	Critical region	p value
Experience with sexting on Instagram	t	W	P
Abundance (yes/no)	10.941	<2.327	$1 \cdot 10^{-24}$

Instagram users received SMS/e-mail with erotic content. Its abundance is statistically significantly greater than abundance of those who received such an SMS/e-mail and do not use Instagram (107 of 242 respondents). We again verified using equality of proportions test.

TABLE VII
HYPOTHESIS 3 EVALUATION USING EQUALITY OF PROPORTIONS TEST. SMS WITH EROTIC CONTENT VS INSTAGRAM USE.

Equality of proportions test, $\alpha = 0.01$	Test criterion	Critical region	p value
SMS with erotic content	z	W	P
Have Instagram account: yes/no	12.661	<2.326	$5 \cdot 10^{-34}$

In both tests we tested $H_0 : \pi_{Instagram yes} = \pi_{Instagram no}$ $H_A : \pi_{Instagram yes} > \pi_{Instagram no}$ and concluded that adolescents who use Instagram have statistically significantly more experience with sexting and thus we accept hypothesis 3.

D. Hypothesis 4

From our survey we discovered that 524 (61.36 %) men and 1216 (69.41 %) women received an erotic message. On the other hand 295 (34.54 %) men and 457 (26.08 %) women claimed that they did not receive any erotic message. We used Chi-square test to evaluate this hypothesis (Tab. VIII).

TABLE VIII
HYPOTHESIS 4 EVALUATION USING CHI-SQUARE TEST. PHOTOS WITH EROTIC CONTENT FOR MEN/WOMEN.

Chi-square test, $\alpha = 0.01$	Test criterion	Critical region	p value
Received erotic photos/videos	χ^2	$\chi^2(0.01; 2)$	p
Women and men	20.027	9.21	$4 \cdot 10^{-5}$

Tab. VIII concludes that the question whether a person receives an erotic message is relevant to its gender.

As we already mentioned, 69.41 % women and 61.36 % men received an erotic photo/video. The amount of women is thus greater. We decided to verify the statistical significance of this difference by equality of proportions test. We tested: $H_0 : \pi_{women} = \pi_{men}$ $H_A : \pi_{women} > \pi_{men}$.

TABLE IX
HYPOTHESIS 4 EVALUATION USING EQUALITY OF PROPORTIONS TEST.
PHOTOS/VIDEOS WITH EROTIC CONTENT FOR WOMEN/MEN.

Equality of proportions test, $\alpha = 0.01$	Test criterion	Critical region	p value
Photos/videos with erotic content	z	W	P
Women vs men	4.094	<2.326	$2 \cdot 10^{-5}$

Even this test concluded (p value lower than the $\alpha = 0.01$) that women receives erotic messages statistically significantly more than men and thus we accept hypothesis 4.

E. Hypothesis 5

In our survey 2482 (93 %) respondents have Instagram account. From them, 1261 (51 %) uses Instagram very often, 776 (31 %) often, 292 (12 %) sometimes 83 (3 %) from time to time and 69 (3 %) that they have an account, but in practice do not use it. We joined their responses together with their responses regarding experience with sexting on Instagram and established the abundance of have experience with sexting on Instagram based on how often they use it (see Tab. X).

TABLE X
HYPOTHESIS 5 EVALUATION. EXPERIENCE WITH SEXTING ON INSTAGRAM BASED ON HOW OFTEN RESPONDENTS USE IT.

Abundance of how often respondents use Instagram	"n"	Sexting "yes" (n; %)
Very often	1261	571 (45.28 %)
Often	776	244 (31.44 %)
Sometimes	292	71 (24.32 %)
From time to time	83	20 (24.10 %)
In practice never	69	6 (8.7 %)

Respondents who claimed to not used Instagram at all (6) we ruled out for this case. The numbers suggests that those who use Instagram more often have more experience with sexting. We decided to verify this by equality of proportions test (Tab. XI) for which we merged last two groups to a single one called 'not so much'. We tested: $H_0 : \pi_1 = \pi_2 = \pi_3 = \pi_4$ $H_A : "$ at least one abundance is different from others".

TABLE XI
HYPOTHESIS 5 EVALUATION USING EQUALITY OF PROPORTIONS TEST.
TIME SPENT ON INSTAGRAM AND SEXTING.

Equality of proportions test, $\alpha = 0.01$	Test criterion	Critical region	p value
Time spent on Instagram and sexting.	χ^2	$\chi_2(0.01; 3)$	P
Abundance	93.538	11.345	$4 \cdot 10^{-20}$

Based on the value of test criterion and p we can say that the result of the test is statistically significant. The abundancies of respondents with sexting experience based on their Instagram usage is vastly different so we decided to compare them among other using Marascuilo procedure.

TABLE XII
MARASCUILO PROCEDURE FOR HYPOTHESIS 5.

Marascuilo procedure, contrast ($\alpha = 0.01$)	Value	Critical value	Significance
$ p(\text{very often}) - p(\text{often}) $	0.138	0.073	Yes
$ p(\text{very often}) - p(\text{sometimes}) $	0.210	0.097	Yes
$ p(\text{very often}) - p(\text{not so much}) $	0.282	0.113	Yes
$ p(\text{often}) - p(\text{not so much}) $	0.071	0.102	No
$ p(\text{often}) - p(\text{not so much}) $	0.143	0.117	Yes
$ p(\text{sometimes}) - p(\text{not so much}) $	0.072	0.133	No

Our expectation that adolescents who spent on Instagram more time are more often involved in sexting was correct. It is also supported by equality of proportions test for statistically significant difference of abundancies of respondents who are involved in sexting on Instagram - those who use Instagram often and those who use it not so much. We tested: $H_0 : \pi_1 = \pi_2$ $H_A : \pi_1 > \pi_2$ (Tab. XIII).

TABLE XIII
HYPOTHESIS 5 EVALUATION USING EQUALITY OF PROPORTIONS TEST.
SEXTING AND TIME SPENT ON INSTAGRAM.

Equality of proportions test, $\alpha = 0.01$	Test criterion	Critical region	p value
Sexting and time spent on Instagram	Z	W	p
Very often and often vs. sometimes and not so much	7.193	<2.326	$3 \cdot 10^{-13}$

The test result is significant. We accept the hypothesis 5.

F. Hypothesis 6

From our survey we discovered that 818 (49.07 %) out of 1667 women and 147 (19.07 %) out of 771 men who has account on Instagram faced sexually offensive behaviour on Instagram. It is clear (see Tab. XIV) that a percentage of offended women is statistically significantly higher. We tested: $H_0 : \pi_{\text{women}} = \pi_{\text{men}}$ $H_A : \pi_{\text{women}} > \pi_{\text{men}}$.

TABLE XIV
HYPOTHESIS 6 EVALUATION USING EQUALITY OF PROPORTIONS TEST.
INAPPROPRIATE BEHAVIOUR.

Equality of proportions test, $\alpha = 0.01$	Test criterion	Critical region	p value
Inappropriate behaviour (in sexual sense)	z	W	p
Experience: men vs. women	14.087	<2.326	$2 \cdot 10^{-45}$

It is clear that women are in more danger than men. We surveyed respondents opinion on this and by Chi-square test verified the relevance of their opinion and gender (Tab. XV).

The test result is significant, the opinion of men and women on security on Instagram is different. Instagram is considered

TABLE XV
HYPOTHESIS 6 EVALUATION USING CHI-SQUARE TEST. SECURITY ON INSTAGRAM.

Equality of proportions test, $\alpha = 0.01$	Test criterion	Critical region	p value
Security on Instagram	χ^2	$\chi^2(0.01;4)$	p
Men and women	15.227	13.277	0.004

as a safe place only by 0.42 % of women. Their abundance is statistically significantly lower than in case of men. We verified this by equality of proportions where we tested: $H_0 : \pi_{women} = \pi_{men}$ $H_A : \pi_{women} < \pi_{men}$ (Tab. XVI).

TABLE XVI
HYPOTHESIS 6 EVALUATION USING EQUALITY OF PROPORTIONS TEST. INSTAGRAM AS A SAFE PLACE.

Equality of proportions test, $\alpha = 0.01$	Test criterion	Critical region	p value
Instagram as a safe place	t	W	p
Men vs. women	-3.708	$(-\infty; 2.327 >$	0.0001

Our results implies that women are in more danger in sense of sexual inappropriaty on Instagram and do not feel safe there as much as men. We accept hypothesis 6.

G. Hypothesis 7

911 respondents claimed to be involved in sexting by received/sent erotic photo/video. On the other hand 709 of them (77.83 %) do not consider Instagram to be an unsafe place (more specifically they say "it depends on person's own behaviour"). 1308 claimed to not receive any erotic photo/video ever, 1002 of them (76.61 %) also do not consider Instagram to be an unsafe place. The difference of these abundancies is not statistically significant (see Tab. XVII). Tested by equality of proportions checked: we tested: $H_0 : \pi_1 = \pi_2$ $H_A : \pi_1 > \pi_2$.

TABLE XVII
HYPOTHESIS 7 EVALUATION USING EQUALITY OF PROPORTIONS TEST. INSTAGRAM AS A SAFE PLACE (BEING INVOLVED IN SEXTING - YES/NO).

Equality of proportions test, $\alpha = 0.01$	Test criterion	Critical region	p value
Instagram as a safe place	z	W	p
Involved in sexting - yes/no	0.673	$< 1.645; \infty)$	0.25

Instagram is considered to be a safe place by same amount of respondents whether they have experience with sexting there or not. This is different from hypothesis 7. We also asked our respondents whether they consider Instagram to be safe place as a whole. From those 12/911 (1.31 %) had experience with sexting and 11/1308 (0.84 %).

The test result is not statistically significant (Tab. XVIII). Even this is not compliant with hypothesis 7 and thus we reject it.

TABLE XVIII
HYPOTHESIS 7 EVALUATION USING EQUALITY OF PROPORTIONS TEST. INSTAGRAM AS A SAFE PLACE AS A WHOLE (BEING INVOLVED IN SEXTING - YES/NO).

Equality of proportions test, $\alpha = 0.01$	Test criterion	Critical region	p value
Instagram as a safe place as a whole	z	W	p
Involved in sexting - yes/no	1.09	$< 1.645; \infty)$	0.138

H. Hypothesis 8

In our survey we asked respondents whether they already took a naked or semi-naked photo. 931 of them (35 %) answered positively, 1608 (61 %) negatively and 115 were unsure (4 %). By equality of proportions test we evaluated a statistical significance of these abundancies. The result was significant ($p < 0.0001$) and statistical significance in compare to each other is depicted by Marascuilo procedure (Tab. XIX).

TABLE XIX
MARASCUILO PROCEDURE FOR HYPOTHESIS 8.

Marascuilo procedure, contrast ($\alpha = 0.01$)	Value	Critical value	Significance
$ p(no) - p(yes) $	0.255	0.04	Yes
$ p(no) - p(unsure) $	0.562	0.031	Yes
$ p(yes) - p(unsure) $	0.308	0.031	Yes

The abundancies are statistically significant and thus we can say the hypothesis 8 expectation is not true. From the equality of proportion test (see Tab. XX) we can see that the abundance of those who never took a naked or semi-naked photo is statistically significantly higher than the abundance of the remaining two options together.

TABLE XX
HYPOTHESIS 8 EVALUATION USING EQUALITY OF PROPORTIONS TEST. TAKING NAKED OR SEMI-NAKED PHOTO.

Equality of proportions test, $\alpha = 0.01$	Test criterion	Critical region	p value
Toke naked or semi-naked photo	z	W	p
No vs. other answer	15.397	$< 2.326; \infty)$	$9 \cdot 10^{-54}$

Based on that we reject hypothesis 8.

IV. RELATED WORK

Our work brings another insight into the area of social network users. For example in [19] authors proved a relation between personality specific traits (more specifically Machiavellianism, narcissism, and psychopathy) and time spent on social networks or individual's specific behaviour like posting (edited) selfies more frequently. Although it was demonstrated

on Facebook³ users, giving its relevance with Instagram (both owned by Meta⁴ and aiming on similar focus group) we consider it to be relevant to our work.

In [20] authors focused again on Facebook users and came to a conclusion that although users deal with stressors such as managing inappropriate or annoying content, being tethered, lack of privacy and control, social comparison and jealousy, and relationship tension and conflict, they still feel pressured to access the site frequently due to the fear of missing out and to keep up with relationship maintenance demands.

Together with our work we see a possible intersection of adolescents spending a lot of time on social networks and experiencing sexting on one side and a very specific group of potentially dangerous individuals with negative traits on the other side (where adolescents despite the negative experience feel pressured to access the site frequently). Giving its potential social impact we see this as a great area for further research.

V. CONCLUSIONS

In the article, we pointed out some dangerous phenomena during online communication in the particular Instagram social network. Our conclusions are supported by answers obtained through a questionnaire survey from more than 3,000 respondents. Modern technologies and social networks such as Instagram became a part of our lives. Together with their benefits we need to learn how to deal with some of their side effects. One of them is easiness of access for our adolescents to sexting which we can expect that with technological progress it will become even more popular. The main aim of this work was to discover how much experience adolescents have with sexting on Instagram. Based on our hypotheses we can conclude that they are involved in sexting, although not that much as we expected. On the other hand we discovered that sexting was often an unpleasant and unrequited phenomena. It often had a nature of harassment or unissued content in a form of photos/videos or messages. Based on this we discovered that the level of security in a sense of sexting or in general is quite low on Instagram. Although adolescents are aware of dangerousness and Instagram in general, their experience with sexting is high. Based on our survey they are very well informed about its risks.

In future we could also use the full potential of the survey and gather more sociological data about our respondents or include also other age groups to obtain a more clear and general picture.

This work in more general way could also provide arguments why such awareness is important in education from lower levels. For example in [16] authors conclude that regarding survey pedagogues are not willing to include some related topics to teaching although even young students are capable of understanding basic concepts of computational thinking [17].

³Facebook home page: <https://www.facebook.com/>

⁴Meta home page: <https://about.meta.com/>

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