Friendships and Happiness in a Digital World.

The effects of the social use of ICTs on friendship quality, life values, and life satisfaction among Polish preadolescents.

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Abstract

Children use information and communication technologies (ICTs) alone from the age of 8 in Poland. It is alarming because digital screen time allegedly lowers life satisfaction. This research checked new mediating mechanisms such as friendship quality and life values (i.e., materialism and humanism) that connect technology and children's life satisfaction. Nowadays friendships can take place online, offline, or in a mixed-mode – social use of ICTs might reinforce children's friendships and affect life satisfaction indirectly. Moreover, in theory, technology could increases exposure to advertisements promoting materialism, and enable communication with others possibly increasing humanism. Materialism, places central focus in life on possessions while humanism on relations with other people – the first might harm life satisfaction, whereas the latter might promote it. In total, 583 Polish preadolescents, aged 9 to 13 from a small, a middle size, and a large city were included in this study. The surveys asked about the frequency of social use of ICTs, perceived quality of online, mixed-mode, and offline friendships, materialism, humanism, and life satisfaction. The data was analyzed using structural equation modeling. The social use of ICTs negatively predicted life satisfaction. Nevertheless, children who used ICTs for social reasons more had better quality of online and mixed-mode friendships, moreover they were more materialist and humanist at the same time. Online friends predicted lower life satisfaction, while offline friendship quality had the opposite effect. Materialism did not predict any variables but lowered humanism. Humanist life goals led to better quality of all types of friends and a more satisfying life. While technology enabled contact with friends, it is the real-life contact and humanist outlook on life, which predicted life satisfaction among Polish preadolescents.
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Contents

Introduction

Contemporary children grow up surrounded by different information and communication technologies (ICTs). Infants start playing with Internet-enabled devices such as computers, tablets, and smartphones (Holloway, Green, & Livingstone, 2013). Young people use technology on their own even before adolescence. When surveyed, middle and secondary school students in Poland noted that they began using the Internet at the age of 10 (Kamieniecki et al., 2017). The 2010 *EU Kids Online* report indicated that 33.0 % of 9 to 10-year-olds in Europe, among the 25,142 children studied, go online every day (Kirwil, 2011). Recent data showed that even younger children start surfing the web. An online study with 518 Polish parents revealed that already 8-year-olds owned a device with Wi-Fi or mobile data ("Norton's my first device report," 2018). Hence, digital initiation in Poland happens at a young age.

There is much concern about the ongoing digitalization, especially among the parents of the young Internet users. Around 68.0% of the questioned adults acknowledged worries about their children overusing technology ("Norton's my first device report," 2018). The aforementioned *EU Kids Online* report listed various dangers associated with the Internet, including exposure to sex, aggression, discriminating ideologies, and marketing (Kirwil, 2011). A Polish study on media literacy warned that while young people can use the Internet, they lack critical skills to evaluate information online (Rozkosz et al., 2014). This concern is particularly alarming when taking into account that Polish children surf the web unsupervised (Kirwil, 2011). Young Poles navigate the online world on their own, left to the possible adverse effects of the use of technology.

The worry about ICTs use also stems from the proposed negative correlation with life satisfaction, happiness, and well-being (which are related yet separate ideas). For instance, Twenge, Martin, and Campbell (2018) examined *Monitoring the Future* survey data and noted a decrease in psychological well-being among 1.10 million American teenagers after 2012. The researchers pointed out a widespread smartphone adoption as a likely culprit of the phenomenon. They argued that ICTs use linked with decreased in-person interactions and lower quality sleep. The measure of well-being in the study included life satisfaction, domain satisfaction (e.g., satisfaction with relationships,

neighborhood, and parents, among others), and self-satisfaction. The authors reported that teens who do not use the Internet at all could be as unsatisfied as those who use it a lot. Thus, Twenge and her team confirmed previous findings from Przybylski and Weinstein (2017) by showing that the screen time and well-being relationship resembled a reverse U-shaped curve.

The digital Goldilocks hypothesis acknowledges the possible harmful influence of technology but champions its moderate use. The thesis posits that digital screen time is not intrinsically harmful but could be beneficial in moderation. Based on a survey with 120,115 British 15-year olds, Przybylski and Weinstein (2017) proposed that screen time and mental well-being were in a curvilinear relationship, which looks like a reverse U-shaped curve. They argued that initially, more screen time increased happiness, life satisfaction, psychological functioning, and social functioning. Only the overuse of screens decreased these measures. The research suggested that the limited use of technology improves well-being, while overuse is harmful to teenagers.

Przybylski and his team challenged their previous results in the two recent studies. First, they examined three large data sets on happiness and technology use in the US and the UK, including the previously mentioned *Monitoring the Future* survey (Orben & Przybylski, 2019b). The authors noted that the effect sizes of screen-time on happiness were quite small and could even be spurious. The research mentioned that the known predictors of lowered well-being, such as bullying or smoking marijuana, have a more substantial effect than screen time. The authors concluded that the existing scholarship does not justify a recommendation to limit the use of ICTs among the youth. Second, Orben and Przybylski (2019a) studied 17,247 digital use diaries of the UK youth. They concluded that there is almost no proof that screen use lowers adolescents' well-being.

The ongoing debates provided contradictory conclusions so far. Some believed that the relationship between technology and happiness exists, some just acknowledged it but doubted its extent. This study assumed that there could be a negative effect of ICTs use on life satisfaction. Following Valkenburg and Peter's advice (2013) from the diverse media effects theory, the research identified mediators of the proposed relationship. This project examined novel mechanisms for the effects of technology use on life satisfaction.

The mediators included friendship quality, materialism, and humanism. Previous work focused on general screen time, which can include multiple activities and multiple effects. The present study had a more narrow scope. The focus was on a specific type of technology use, namely the social use of ICTs, the frequency of communication through applications and device functions. For instance, practices such as calling, messaging, or using social media were studied. This specific choice of variables allowed creating a model, which connected all the studied concepts.

Previously discussed scholarship based analyses on Western samples but presented the conclusions as universal. There is an overrepresentation of westerners in research on children and media (Jordan & Prendella, 2019). The present study had scientific relevance because it examined a new sample from Poland. Furthermore, all previously reported work has been done with children older than 13 years old, this study checked the same relationship among preadolescents, aged 9 to 13. Parents tend to worry more about younger children using technology because life habits still develop during childhood. This study had a social relevance due to the data-driven conclusions about technology use, whether it has positive or negative influences on children. Such information could be useful for parents.

Theory

Social Use of ICTs and Life Satisfaction

The studies described before measured the effects of screen time on happiness, life satisfaction, or well-being. Przybylski and Weinstein (2017) argued that the overuse of digital devices could displace other activities like meeting friends, exercising, or reading books. Twenge, Martin, and Campbell (2018) assumed a similar mechanism but could not provide empirical support for it. They found out that the frequency of face-to-face interactions predicted well-being but also reported that technology use increased face-to-face interactions, especially among older children. Their work provided no support for the hypothesis that technology makes real-life meetings occur less often. Smartphones can be used for arranging meetings in real life. The mechanism for the negative influence of technology on life satisfaction remains unclear. Because scholars still dispute the extent of the negative relationship between ICTs use and life satisfaction (Orben & Przybylski, 2019a; Orben & Przybylski, 2019b; Przybylski & Weinstein, 2017;

Twenge, Martin, & Campbell, 2018), this research replicated the previous design with a direct relationship between the variables. Therefore, the first research question was:

RQ1: How does the social use of ICTs influence life satisfaction among Polish preadolescents?

While the results and conclusions on technology use vary, few to none publications reported a direct positive relationship between ICTs use and life satisfaction. Furthermore, a meta-analysis of 21,258 participants, whose average age was at least 13 years, yielded 43 independent correlations between Internet use and well-being, with the mean of -.05 (Huang, 2010). Hence, a small negative effect of Internet use on well-being has been discovered consistently in recent years. The technology use and life satisfaction have not been studied directly among preadolescents, yet this research assumed the same relationship as for adolescents. Therefore, the following hypothesis was posed:

H1: The social use of ICTs leads to lower life satisfaction among Polish preadolescents.

Social Use of ICTs and Friendships

Given the current state of scholarship, it is hard to predict well-being based only on technology use. There are still reasons to believe that ICTs have an indirect effect on happiness, even possibly enhancing it. Life satisfaction has predictors that gained a considerable academic consensus. For instance, a recent policy recommendation report argued that robust social connections led to a happy life (Diener et al., 2018). Extensive research supported this document. A comparative project in 155 countries revealed that social support is a far more important average happiness predictor than GDP or healthy life expectancy (Helliwell, Huang, & Wang, 2017). Social connections and support from, for instance, friends, predicted a satisfying life.

Multiple reports indicated that people used modern ICTs for social reasons (Wajcman, Bittman, Jones, Johnstone, & Brown, 2007; Zilka, OnlineFirst). In Poland, 90.6% of surveyed teens reported speaking to their friends online at least once a week (Kamieniecki et al., 2017). There are numerous works, which showed that online communication led to meaningful friendships among youth (Quinn & Oldmeadow, 2013; Valkenburg & Peter, 2007; Valkenburg & Peter, 2009). Moreover, many studies done in the early 2000s showed that online communication was linked positively to life

satisfaction because of the mediating effect of relationships quality (Valkenburg & Peter, 2009).

The Internet enabled new ways of connecting with others, allowing people to talk to each other or arrange face-to-face meetings. Friendships these days could happen online, offline, and through both ways in a mixed mode. This project distinguished between three different types of friends to account for various ways of communicating. There could be children who have friends they see mainly in the real world (i.e., offline friends). There could be friendships that are sustained only through technology and the Internet (i.e., online friends). Logically though, most of the friendships should be sustained both online and offline (i.e., mixed-mode friends).

The present study replicated previous research on the direct influence of social use of technology on friendships and indirect influence on life satisfaction. The investigation of the effects of Internet use among current Polish preadolescents was pertinent. This sample choice ensured that the studied population was the first group of digital natives, born and raised with access to the Internet. The country had undergone a rapid digitalization, which gave a chance to explore its effects. Preadolescents of interest, aged 9 to 13, grew up in homes connected to the Internet. The studied sample was born between 2006 and 2010 when the percentage of households with children and Internet connection rose from 47.3% to 82.9% in Poland (Berezowska et al., 2010). In total, between the years 2004 and 2017, the households with Internet share increased from 26.0% to 81.9% (Gontarczuk, Jaszkowski, Kulczycka, Pudłowski, & Skrzypek, 2008; Gumiński et al., 2018). The selected children used technology to communicate from an early age. They sustained friendships both in the online and offline worlds. However, the effects of the social use of technology on friendships quality and life satisfaction have not been studied yet in Poland. Thus, the following research question was posed:

> RQ2: How does the social use of ICTs among Polish preadolescents influence their perceived quality of online, mixed-mode, and offline friendships and subsequently how does the perceived quality of online, mixed-mode, and offline friendships influence their life satisfaction?

As mentioned before, the positive influence of Internet communication on friendship quality has been well-established academically despite the initial worries about

the web. Contrary to the findings from the 1990s when Internet access and use were limited to few people, the research conducted in the 2000s when many more people surfed the web showed that online communication increased closeness to friends (Valkenburg & Peter, 2009). A previous study from the same authors revealed that the same relationship is true for preadolescents, and both early and late adolescents, based on the analysis of 665 Dutch children aged 10 to 16 (Valkenburg & Peter, 2007). In another study, British boys under the age of 13 had an increased sense of belonging to a friends group because of social networking online (Quinn & Oldmeadow, 2013). Finally, the longitudinal research on 545 Canadian highschoolers, aged 16 and 17, indicated that the relationship is stable over time, at least for older children (Desjarlais & Willoughby, 2010).

Previous work introduced online, mixed-mode, and offline friendship distinction. A study on Canadian university students found little differences in the reported quality of these friendship types based on 141 19-year-olds (Boute, Wood, & Pratt, 2009). In later research, online and mixed-mode friends had higher friendship quality than offline ones among the 2,188 active users of Hyves, a Dutch social networking site (Antheunis, Valkenburg, & Peter, 2012). Internet communication enabled maintaining new types of friends, such as online ones and mixed-mode ones. However, the positive effect of ICTs might happen for offline friends as well. The children who communicate more through different ICTs might be more motivated to pursue meaningful friendships of all types. While the strength of the effect might differ between online, mixed-mode, and offline friendships, this research assumed that the direction of the relationship is the same for them. Thus, the following hypotheses were posed:

H2a: The higher social use of ICTs leads to greater perceived quality of online friendships among Polish preadolescents.

H2b: The higher social use of ICTs leads to greater perceived quality of mixed-mode friendships among Polish preadolescents.

H2c: The higher social use of ICTs leads to greater perceived quality of offline friendships among Polish preadolescents.

The link between relationships and happiness has been investigated across different nationalities. A cross-cultural study of 13,118 college students in 31 nations

indicated that friendship satisfaction predicted life satisfaction in both the individualist and collectivist cultures (Diener & Diener, 1995). These findings were replicated in a post-communist context, analogous to the Polish one. The study of 401 Croatian adolescents, aged 15 to 20, showed a positive correlation between the quality of friendship and life satisfaction (Raboteg-Saric & Sakic, 2014). While the conclusions were drawn based on older samples, similar mechanisms could be true for younger samples. Therefore, the following hypotheses about the quality of friendships were proposed:

H3a: The higher perceived quality of online friendships leads to higher life satisfaction among Polish preadolescents.

H3b: The higher perceived quality of mixed-mode friendships leads to higher life satisfaction among Polish preadolescents.

H3c: The higher perceived quality of offline friendships leads to higher life satisfaction among Polish preadolescents.

Previous work has not examined whether different friendship types have different effects on life satisfaction. Relationships sustained through technology could be meaningful sources of emotional support, which could lead to a happy life, just like relationships sustained offline do.

Social Use of ICTs and Life Values

Technology enables not only new ways of contacting people but also promotes certain life values. On the one hand, the social use of ICTs enables making new connections with others, which might make people more inclined to care for relationships in life generally. On the other hand, technology promotes materialism. A lot of applications and websites seem to be free but, in exchange, users view numerous advertisements. Vandana and Lenka (2014) discussed a theory that advertising in various media is responsible for increasing children's materialist life goals. Advertisements aim to make products wanted. Various marketing strategies show that consumption is necessary for happiness. Even the social use of ICTs could increase children's exposure to marketing, often in inconspicuous ways. For instance, paid influencers use social media platforms such as Facebook or Instagram to promote given brands. In Poland, such product placement is rarely marked as sponsored content. Brands appear as parts of the

seemingly accidental background. While online audiences condemn such practices, the issue remains largely unregulated in Poland. Advertisements saturate the Internet to pay for free content. The materialism rises with exposure to commercial content.

While the desire to have more goods is not negative on its own, previous works argued that materialism lowers well-being (Kasser, 2002). One possible mechanism behind this relationship is a value conflict between the pursuit of human connections and wealth accumulation, leading to psychological tension (Burroughs & Rindfleisch, 2002). The other possible mechanism is that an excessive focus on possessions could cause envy in the already materialist person. This emotion spoils friendships, necessary for a happy life. Envy lowered group satisfaction in a longitudinal study of 143 small workgroups (Duffy & Shaw, 2000). Modern technologies could indirectly decrease life satisfaction by encouraging materialism and thus discouraging social connections.

Little to no previous research has examined how life values mediate the relationship between the social use of technology and life satisfaction. Therefore, the third research question read as follows:

> RQ3: How does the social use of ICTs among Polish preadolescents influence their materialist and humanist values and, subsequently, how do materialist and humanist values influence the perceived quality of their online, mixed-mode, and offline friendships and life satisfaction in general?

Social use of ICTs does not create life values but affects the already existing cultural model. Poland has been distinguished by low materialist values, those focusing on possessions and high humanist values, those focusing on relationships with others (Boski, 1999). The dimensions of Polish humanism included lasting friendships, disinterested help, social justice, and kindness to others (Boski, 2006; Boski, 1999; Rymek-Gmytrasiewicz, 2006 as cited in Boski, 2008). Humanism places central focus in life on relationships, be it with family, friends, or a larger society (Boski, 2006). Western scholarship rarely discussed humanist values. Boski (1999) developed this measure to describe the importance of social ties in his native, Polish culture. The further studies showed that Polish immigrants to the West retained their humanism (see a summary in Boski, 2006). In Western scholarship, cultures are scored on their collectivist and individualistic dimensions, which present a person as either independent or dependent on

others (Hofstede, Hofstede, & Minkov, 2010). Poland scored higher on collectivism than most Western European countries, which offered further support for Boski's conclusions. As discussed before, modern ICTs could enable social connections and communication but could also encourage materialism. Therefore, the present research studied these aspects of modern ICTs in a culture, which generally promotes humanism and anti-materialism.

Polish life values have been changing in the last 30 years. Available data showed that in 2016, 48.0% of 1,724 students (who were at least 16 years old) indicated love and friendship as one of their main three life goals, while only 28.0% indicated wealth accumulation as one of their top three (Boguszewski, 2016). The same report cited earlier studies from the same national institute to indicate that both the goals have increased since 1994. Another study found no expected differences between Polish and American business students' materialism (Tobacyk et al., 2011). Polish life values have been transforming possibly due to changes in daily life. Globalization and access to technological innovations started in 1989 when communism fell. The popularization of ICTs in the last 30 years could have influenced how Polish people view relationships with others and material possessions

Hypotheses about materialist values. Empirical work reported that materialism correlated with greater exposure to advertisements (Opree, Buijzen, van Reijmersdal, & Valkenburg, 2014; Vandana & Lenka, 2014), Internet indulgence (Behal & Soni, 2018), and smartphone use (Lee, Chang, Lin, & Cheng, 2014). Behal and Soni (2018) surveyed 714 young Punjabis, aged 15 to 24, and found that Internet indulgence led to higher materialism. Exposure to advertisements increased materialism among 466 Dutch children, aged 8 to 11, in longitudinal study (Opree, Buijzen, van Reijmersdal, & Valkenburg, 2014). A similar study of 325 Taiwanese of various ages above 17 showed that compulsive smartphone use correlated with higher materialism (Lee, Chang, Lin, & Cheng, 2014). While there could be cultural and age differences in the use of technology among the Punjabis, Taiwanese, and Polish samples, there is still a similar mode of engagement and similar exposure to advertising in the three contexts. Polish youth uses applications in the same way as other people around the world. They desire the same advertised goods and technological advances. Moreover, while little research examined

the effect of online or mobile advertising on young children, it is still reasonable that the same mechanism holds true. One policy analysis warned that young children are particularly susceptible to the effects of advertising on materialism in multiple media (Kasser & Linn, 2016). In light of the discussed studies, the following hypothesis was put forth:

H4: The higher social use of ICTs leads to higher materialist values among Polish preadolescents.

The initial studies about materialism from before the 2000s pointed out a negative effect on social connections. College students who were more materialist reported lower satisfaction with their relationships (Kasser & Ryan, 2001; McHoskey, 1999). Recently, some studies on children focused on the reverse link where peer rejection caused materialism. Children who lack social support could turn to possessions as a source of life satisfaction. For instance, a survey of 171 British children, aged 7 to 11, showed a positive correlation between peer rejection and materialism (Banerjee & Dittmar, 2008). Similarly, research on 100 American children, aged 10 to 18, pointed out that those who reported higher peer support, reported lower materialism (Chaplin & John, 2010). The discussed studies from 2008 and 2010 were cross-sectional; they proved correlations while causal relations were derived from the theory. This research assumed that materialism is a belief about a good life, which determines behavior and thus affects friendship quality.

There is some indirect support for the hypothesis that materialism decreases quality of relationships from Poland. A research on 169 Polish middle and high school students, aged 17 on average, reported that materialism as a life value correlated negatively with kindness to others (Zawadzka & Lewandowska-Walter, 2016). The focus on material possessions might lead to being preoccupied with oneself rather than others. Logically, those who are less kind to others should have a lower quality of friendships. The following hypotheses were presented, assuming that the relationship held true for younger children as well:

H5a: The higher materialist values lead to lower perceived quality of online friendships among Polish preadolescents.

H5b: The higher materialist values lead to lower perceived quality of mixed-mode friendships among Polish preadolescents.

H5c: The higher materialist values lead to lower perceived quality of offline friendships among Polish preadolescents.

Multiple research projects from the past 40 years showed that materialism consistently predicted lower well-being (meta-analysis reported in Burroughs & Rindfleisch, 2002). The studies focused on adolescents, college students, and adults. The same relationship was a crux of Kasser's 2002 book *The high price of materialism*. The author discussed multiple published and unpublished projects, which indicated that materialist aspirations correlated with lowered well-being. The researcher measured well-being in different ways by focusing on life satisfaction, happiness, but also noting depression, social anxiety, and stress symptoms. These results have already been replicated in the context of post-communist youth. A study of 1,114 Hungarians, aged 14 to 21, showed that material happiness, one of the dimensions of material values, correlated negatively with life satisfaction (Piko, 2006). Analogous results, based on 139 middle school students, aged 16 on average, were obtained in Poland, where brand attachment correlated negatively with life satisfaction (Zawadzka, 2013). In light of the above research, the following hypothesis was put forth about preadolescents, thus assuming that the same relationship holds across different age groups:

H6: The higher materialist values lead to lower life satisfaction among Polish preadolescents.

Hypotheses about humanist values. There is virtually no research, which identified the predictors of humanist values. As mentioned before, the concept was created to describe the unique aspects of Polish culture. Nevertheless, the research on the use of the ICTs suggested that modern technology fosters social ties, which then could lead to more humanist life values. A study of the Australian population, aged 15 and older, indicated that mobile phones serve primarily to communicate (Wajcman, Bittman, Jones, Johnstone, & Brown, 2007). Similar research on Israeli youth, aged 15 to 18, showed the same social purposes for using smartphones (Zilka, OnlineFirst). Finally, focus groups with American 18-year-olds revealed that closeness with a person influenced youth's choices on devices and ways to communicate (Agosto, Abbas, &

Naughton, 2012). The cited studies show that technology and communication are strongly related. There could be positive reinforcement feedback where more communication enhances likelihood to be contacted and contact someone else. Perhaps those who communicate more through technology, start valuing connections with others more in general. It is logical to assume the same relationship for preadolescents. Additional ways of communication through apps and devices should strengthen their humanism because their life values still develop. The following hypothesis was proposed:

H7: The higher social use of ICTs leads to higher humanist values among Polish preadolescents.

The effects of Polish humanism were not studied yet either. However, there is enough scholarship to suggest possible relationships. A close indicator of caring for other people is the concept of allocentrism, which is the individual focus on emotional ties and dependence on others (Morry, 2005). Allocentric individuals are more common in collective cultures such as Poland because they focus on relationships with others. Allocentrism is thus similar to a humanist life orientation. Both concepts describe deeply held beliefs about the importance of other people. Morry (2005) found that allocentric values led to higher friendship satisfaction among 228 Canadian college students, aged 19 on average. Similarly, humanist orientation, characteristic of Polish people, should lead to greater satisfaction with friendships, be it online, mixed-mode or offline ones. This research assumed that humanist life values would have the same effect in all age groups in Poland. Therefore, the following hypotheses were posited:

H8a: The higher humanist values lead to higher perceived quality of online friendships among Polish preadolescents.

H8b: The higher humanist values lead to higher perceived quality of mixed-mode friendships among Polish preadolescents.

H8c: The higher humanist values lead to higher perceived quality of offline friendships among Polish preadolescents.

Life satisfaction is closely related to social support and friendships (Diener et al., 2018; Diener & Diener, 1995; Helliwell, Huang, & Wang, 2017; Raboteg-Saric & Sakic, 2014). Therefore, the humanist life values, which encourage interconnectedness, should also increase life satisfaction. The research on Catalonians, aged 12 to 16, showed that

interpersonal values, defined by family orientation, sensitivity, and sympathy to others predicted life satisfaction (Casas, Gonzalez, Figuer, & Coenders, 2004). The study of 218 UK youngsters, the exact age unreported, showed a positive correlation between intrinsic life goals, those related to the need for human connectedness, and life satisfaction (Linley et al., 2004 unpublished, cited in Proctor, Linley, & Maltby, 2009). The intrinsic and interpersonal goals are close proxies for the humanist life value, which allowed the following hypothesis:

H9: The higher humanist values lead to higher life satisfaction among Polish preadolescents.

Materialism and Humanism

Lastly, this research examined whether materialist and humanist values conflicted in children. In other words, the present study checked whether Polish preadolescents who were more materialist were simultaneously less humanist-oriented and vice versa. Previously mentioned *The high price of materialism* by Kasser (2002) was based on the premise that materialism has negative effects on human relationships. Those who generally choose wealth accumulation in life might become self-interested and less focused on maintaining relationships with others. For adults, financial gains often come at a price of longer working days, which then takes away time for human relationships. Children do not experience the same pressure but might internalize the thoughts and behaviors of their parents and thus, take the impossibility to care for both money and human relationships for granted. For this reason, the final research question was posed:

RQ4: How does materialism influence humanism among Polish preadolescents?

Boski (1999), based on a series of studies in the 1990s, established that humanism-materialism is a cultural dimension, which described Polish culture. In his research, adult Poles who had more humanistic goals had simultaneously low materialist goals and vice versa. Previously mentioned work found that materialism and kindness to others were negatively correlated among Polish students aged 17 (Zawadzka & Lewandowska-Walter, 2016). There is no research, which examined how these two life values influence each other in young children. However, because teenagers indicated the same conflict between materialism and humanism as adults did, the following hypothesis was put forth:

H10: The higher the materialist values lead to lower humanist values among Polish preadolescents.

Figure 1 showed the visualization of the relations discussed in the research questions. The first research question was shown in black. Red pathways referred to the second research question. The green pathways referred to the third research question (dark green refers to the materialist pathway and light green to the humanist pathway). Finally, the blue arrow represented the fourth research question. Each line in the model corresponded to a hypothesis based on the discussed empirical research.

<Figure 1 about here>

Methodology

Participants

The research was conducted during the spring of 2019 in three primary schools in a small (population <10,000 people), a middle-size (population <200,000 people), and a large city (population >200,000 people) in Lower Silesia, Poland. Most of the youth in the country goes to public schools, which admit all candidates from the surrounding area. The research sought the participation of all the students in grades 4 to 6. Some of the participants had slight mental or physical disabilities yet support teacher or the researcher helped these children fill out the questionnaire by reading questions aloud and explaining them further if necessary.

The researcher distributed 658 surveys to children aged 9 to 13. The number of complete surveys returned was 583. The completion rate, 88.6%, appears low but the research excluded all children who skipped at least one question. The paper and pencil survey method was chosen because it ensured that every child could readily participate without having to access any device. Of the total sample, 49.9% were girls (291). The mean age was 11.26 with a standard deviation of 1.10. There were 111 children from a small city, 299 from a middle city, and 173 from a large city. The sample was representative of the people living in the cities both in Lower Silesia and Poland. The percentages of small, middle, and large city populations were 19.0%, 51.3%, and 29.7% for the sample, 13.9%, 54.2%, and 31.9% for Lower Silesia, and 9.9%, 57.0%, and 33.1% for Poland (Stańczak & Znajewska, 2017). The percentages for the region and the country included only urban populations.

Ethical Considerations

The Faculty Ethical Review Board approved the design of this study. First, the headmasters of the schools signed the active consent forms. Then, the schoolteachers distributed passive consent forms to the parents via an online school-parent communication system. The notice informed about the studied topic, the research design, and the background of the researcher. The guardians had at least a week to withdraw their children from the study. Two parents decided to exclude their children's participation. Finally, the students could choose not to fill out a survey or skip questions. Two children did not want to start the questionnaire at all. The principal researcher was present during all the data collection activities. The introduction described the procedure of answering the questions and stressed voluntary participation. The survey took around 20 minutes to complete.

Survey Development and Measures

The questionnaire was first written in English and then, translated to Polish (see Appendix B for the English version). Besides the questions, there were necessary explanations of the discussed concepts such as online, mixed-mode, and offline friends. The questions about the use of particular applications had their logos to ensure clarity and children-friendly design.

Social use of ICTs. The measure included the most popular communication practices associated with technology. The frequency of using an ICT was asked about during an average week. The explanation stressed that a normal week included weekdays and a weekend to make sure that children considered different parts of their weekly life. Both the device functions and downloadable applications were studied. The survey had questions about calling, texting, and video-chatting to account for the standard functions of the phones. The questionnaire also included the most popular applications that Polish mobile users utilize ("Mobile is spicy," 2017). While the cited market analysis asked the opinions of the teenagers who were at least 15 years old, the report was used in the absence of data on younger app users. Only communication applications were included (Messenger, Whatsapp, Snapchat, email, Instagram, Youtube, and Facebook). To capture social use of ICTs in full, children answered questions on both private channels such as Messenger or Whatsapp and public ones such as Youtube, Instagram, and Facebook,

where comments and likes are available for many users at once. There were 11 questions in the measure because Instagram was mentioned both as a one-on-one communicator and a social media platform. Facebook had a separate question about Messenger application.

The questions asked how often a given function or application was used during an average week. The response options were (1) *very often*, (2) *often*, (3) *sometimes*, (4) *almost never*, and (5) *never*. The raw data were reverse coded into new variables, where an increasing score indicated the higher frequency of using a given application. Social use of ICTs was computed as an average of the recoded variables. The scores ranged from 1.18 to 4.73 ($M = 2.78$; $SD = 0.76$). On average children used ICTs for social reasons little less than sometimes during an entire week.

Life satisfaction. Children's life satisfaction was measured using the Student Life Satisfaction Scale proposed first by Huebner (1994) and adjusted by Opree, Buijzen, van Reijmersdal, and Valkenburg (2011). The questions asked how satisfied children were with their (i) life, (ii) house, (iii) parents, (iv) friends, (v) classmates, (vi) school, (vii) themselves, and (viii) how satisfied they were in general. The answers were (1) *yes, very satisfied*, (2) *yes, satisfied a bit*, (3) *no, not so satisfied*, (4) *no, not satisfied at all*. The reverse coded variables reflected the increasing life satisfaction with the increasing score. Based on the previous literature (Huebner, 1994; Opree, Buijzen, van Reijmersdal, & Valkenburg, 2011), life satisfaction was kept as one reliable factor, $\alpha = .78$. The average life satisfaction was computed. Life satisfaction ranged from 1.50 to 4.00 ($M = 3,48$; $SD = 0.44$). On average children tended to be more than a bit satisfied with their life.

Perceived quality of friendships. The research used an adjusted quality of friendships scale (Antheunis, Valkenburg, & Peter, 2012), developed first by Marsden and Campbell (1984). The items included: (i) do you feel close to your friends, (ii) do you trust your friends, and (iii) do you think your friends are important. The answers ranged from (1) *yes, a lot*, (2) *yes, a little*, (3) *no, not really*, to (4) *no, not at all*. The question on asking for help, included in the original design, was dropped to avoid an overlap with a humanism indicator, "do you think helping others without expecting anything in return is important?" There were separate sections for online, mixed-mode,

and offline friendships. The answers were reverse coded into new variables where the increase in score meant greater closeness to friends.

The confirmatory factor analysis for all the types of perceived friendship qualities showed three factors including three questions each about different friendships, accounting for 80.6% of the variance. The Cronbach's alpha for the perceived quality of online friendships was .89, for the perceived quality of mixed-mode friendships .86, and for the perceived quality of offline friendships .89. The average quality was computed for the three types of friendships. The range for all the friendship qualities was 1.00 to 4.00. The average online friendship quality was the lowest (M = 2.45; SD = 0.95), which meant that children were tending towards being close a little to their online friends. The mixed-mode and offline friendship had similarly high average quality, which indicated being at least a little close to these friends. For the mixed-mode friendship quality M = 3.31 and SD = 0.68, and for the offline friendship M = 3.37 and SD = 0.80.

Materialism. The shortened Material Value Scale for children was used (Opree, Buijzen, van Reijmersdal, & Valkenburg, 2011). The questions asked whether children think that (i) owning expensive things is important, (ii) owning expensive brands is important, (iii) buying expensive things makes them happy, (iv) they would be happier if they owned more expensive clothes, (v) they like children who own expensive things more than other children, and (vi) they like children who owned more than themselves as much as they like other children. The answers ranged from (1) *yes, very much*, (2) *yes, a little*, (3) *no, not really*, to (4) *no, not at all*. The variables were reverse coded to ensure that a higher score indicated higher materialism. In line with previous research, this analysis kept materialism as a single factor, with Cronbach's alpha of 0.76. The average materialism was computed. Materialist score ranged from 1.00 to 4.00 (M = 2.28; SD = 0.75). On average, children were not really materialist.

Humanism. The indicators of the humanist life value from Boski (1999) were used. The initial scale included measures such as selfless sympathy and helpful hand, care for life-long friendships, Christian morality, taking happiness in the family, the well-being of own children, sense of humor, gentlemanly attitude towards women, kindness and politeness, and equality of all races (Boski, 2006). To ensure content validity, only measures, which reflected situations familiar to all the children were kept and adjusted.

Moreover, another indicator from previous research was added, speaking out against injustice (Boski, 1999). The final questions asked whether participants think that (i) lasting friendships, (ii) disinterested help, (iii) speaking out against the unjust treatment of their friends, and (iv) being kind to family, (v) friends, and (vi) strangers were important. The answers ranged from (1) *yes, a lot*; (2) *yes, a little*; (3) *no, not really*; to (4) *no, not at all.* The answers were then reverse coded to show that increasing score reflected an increase in the humanist orientation. Based on the previous literature (Boski, 1999), humanism was treated as a single concept. The construct failed the reliability test as the Cronbach's alpha was low, $\alpha = 0.56$. The measure could not have been improved sufficiently by removing one or more items from the analysis. Nevertheless, the average score for humanism was computed and used. Humanism had the lowest range from 2.00 to 4.00. The mean was also quite high, $M = 3.64$, $SD = 0.35$. This meant that on average children tended to be humanist a lot.

Control variables. The research controlled for the following variables: general use of ICTs, devices per person, age, gender, and school's location. The general use of ICTs was measured with questions on how often children used PCs, laptops, tablets, and smartphones during an average week. There were separate questions for separate devices. The answers included (1) *very often*, (2) *often*, (3) *sometimes*, (4) *almost never*, and (5) *never.* The reverse coded answers showed that increasing score for a device use indicated more frequent use. The average general use of ICTs was calculated. The range was from 1.50 to 5.00 ($M = 2.82$; $SD = 0.56$), thus indicating that on average children used the ICTs for general purposes sometimes during an entire week. The survey asked questions about the number of household members (answers included 2, 3, 4, 5, 6 or more) and the number of the mentioned devices owned by the entire family (answers included 0, 1, 2, 3, 4 or more). The questions were asked separately for each device. Then, the number of devices per person in the household was computed. The answers "4 or more" were coded as 4 and "6 or more" as 6. The range for the number of devices per person was 0.50 to 7.00 ($M = 2.02$; $SD = 0.74$). On average, children had at least 2 devices to access the Internet at home. Gender was recoded, so that (1) indicated a girl and (0) indicated a boy. Age was recoded into numerical values. Two dummy variables were created to describe three locations. The scores (0) for location middle city, and (0) for location large city

indicated the small city; (1) for location middle city, and (0) for location large city indicated the middle city, and (1) for location middle city, and (1) for location large city indicated the large city.

Results

The data was analyzed in SPSS Amos 26 using structural equation modeling to test the fit to the entire theoretical model. This approach allowed checking all the hypotheses at once. All the studied concepts were included as manifest variables. This choice reduced the number of parameters to be estimated. The full model did not indicate a good fit of data (see Appendix C for a summary of results and discussion of modifications of the first model). Therefore, the insignificant relationships between main and control variables were trimmed to increase the fit of data. If a relationship was significant for the large city, it was also kept for the middle city even if it was not statistically significant for the middle city and vice versa. The final model presented below had a ratio of 583 cases to 55 parameters, which was close to Kline's (2011) 10 cases per parameter rule. The Chi-Square was 100.32, $p = .000$, with 36 degrees of freedom. The ratio of Chi-Square to the number of the degrees of freedom was 2.79, which fell below the value of 5.00 as recommended (Hooper, Coughlan, & Mullen, 2008). This measure, along with the following ones, indicated a good fit of the data to the model. The comparative fit index, CFI, equaled .93, which was larger than the recommended .90 (Kline, 2011). Moreover, the root mean square error of approximation, RMSEA = .06, fell below the recommended value of .08 (Kline, 2011). Therefore, the model showed in Figure 2 was retained and analyzed. Red pathways showed negative correlations and green ones showed positive ones. The control variables were not shown for clarity (see Appendix D for the summary of statistically significant relationships between the control and main variables).

The model reported standardized beta coefficients to present the strength of the relationships, and squared multiple correlations to present the estimates of how much variance in the variable score was explained by the model. The relationships were small or very small in a statistical sense. The model explained around 10.0% of the variance for most of the measures. The analysis indicated that the model discussed important variables that explained changes in each other.

<Figure 2 about here>

Results for Research Question 1: Life Satisfaction

The social use of ICTs had a very small, negative effect on life satisfaction, β = -.09, p = .036. Hypothesis 1 was confirmed, the social use of ICTs led to lower life satisfaction among Polish preadolescents. The model explained 11.5% of life satisfaction variance based on the influence of the social use of ICTs, humanism, and online and offline friendship qualities.

Results for Research Question 2: Friendships

The social use of ICTs had a positive effect on the perceived quality of online friendships, β = .26, p = .000, and on the perceived quality of mixed-mode friendships, β = .11, p = .004. The relationships were small. The hypotheses 2a and 2b were confirmed. The higher social use of ICTs led to greater perceived quality of online and mixed-mode friendships among Polish preadolescents. No statistically significant relationship was found between the quality of offline friendships and social use of ICTs. Hypothesis 2c was not confirmed. The higher social use of ICTs did not lead to greater perceived quality of offline friendships among Polish preadolescents. The model explained quite well the variance of perceived quality of online friendships, 14.0%, and mixed-mode friendships, 12.5%. The R^2 for the offline friendship quality was smaller, 4.8%.

The perceived quality of online friendships had a very small negative effect on life satisfaction, β = -.08, p =.065, which meant that the relationship was marginally significant. Hypothesis 3a was not confirmed and a possible opposite relationship was found. The higher perceived quality of online friendships led to lower life satisfaction among Polish preadolescents. The hypothesis 3b was not supported. The higher perceived quality of mixed-mode friendships did not lead to higher life satisfaction among Polish preadolescents. The perceived quality of offline friendships had a very small positive effect on life satisfaction, β = .08 and p = .046. Hypothesis 3c was supported. The higher perceived quality of offline friendships led to higher life satisfaction among Polish preadolescents.

Results for Research Questions 3 and 4: Life Values

The standardized β coefficient for the influence of the social use of ICTs on materialism was .25 with a p = .000, which made it an almost certain effect. Hypothesis 4

was confirmed. The higher social use of ICTs led to higher materialist values among Polish preadolescents. Compared to other effects, this relationship was strong but still considered to have a small statistical effect. The model explained 11.7% of the variance in materialism. Hypotheses 5a, 5b, 5c, and 6 were not supported. The higher materialist values did not lead to lower perceived quality of online, mixed-mode, or offline friendships, nor to lower life satisfaction among Polish preadolescents.

The social use of technology positively predicted humanism with $\beta = .09$ and $p = .053$, which meant a very small effect. The relationship was marginally significant. These results provided some support for hypothesis 7. The higher social use of ICTs led to higher humanist values among Polish preadolescents. Yet the influence of ICTs on materialism was stronger and more certain. The model explained 5.1% of the variance in humanism. Moreover, humanism positively predicted the higher quality of all types of friendships. The relationship for online friends was very small**,** $\beta = .08$, and statistically significant with $p = .038$. The relationships were the strongest for mixed-mode friendships, $\beta = .27$, $p = .000$ and offline friendships, $\beta = .22$, $p = .000$. Thus, the hypotheses 8a, 8b, and 8c were confirmed. The higher humanist values led to higher perceived quality of online, mixed-mode, and offline friendships among Polish preadolescents. Humanism had a positive effect on life satisfaction, $\beta = .20$, $p = .000$. Hypothesis 9 was confirmed. The higher humanist values led to higher life satisfaction among Polish preadolescents.

Lastly, materialism had a negative effect on humanism. The relationship was of moderate effects compared to the model and of small effects in a statistical sense, $\beta = -.11$, with $p = .009$, which made it statistically significant. Hypothesis 10 was confirmed. The higher the materialist values led to lower humanist values among Polish preadolescents.

Discussion

This project aimed to examine the influence of social use of ICTs on the lives of Polish preadolescents. The study focused on how technology affected life satisfaction (research question 1), friendships (research question 2), life values (research question 3), and how materialism affected humanism (research question 4). The connections between

life values and friendship quality were included in the study. The discovered model described complex relationships, which relate the main variables.

In response to the first research question, the social use of ICTs had a small negative effect on life satisfaction. This finding replicated previous results (Huang, 2010; Przybylski & Weinstein, 2017; Twenge, Martin, & Campbell, 2018). The standardized coefficient was almost twice as much as the average reported in the meta-analysis but had the same negative sign (Huang, 2010). Moreover, the β was higher than the disputed correlations between screen time and well-being but lower than well-known predictors of low life satisfaction such as bullying (Orben & Przybylski, 2019b). Because no other mechanism explained this relationship fully, there could be other unidentified factors at play. For instance, the *EU Kids Online* mentioned dangerous content online (Kirwil, 2011). Higher exposure to such content and its unsupervised consumption could cause a negative effect on life satisfaction. Even the social use of ICTs can spread potentially harmful materials. Some of the applications such as Snapchat, Facebook, Instagram, and YouTube, have a lot of extra content, besides the interpersonal communication messages. According to the findings from "Pato-content in the Internet," 37.0% of Polish children (n = 400) heard of and saw some harmful information online in the past year (Wójcik et al., 2019). Definitely not all the children that saw something pathological online started feeling less satisfied in life. However, this possible phenomenon could help to explain the small negative effect of the social use of ICTs on life satisfaction.

In response to the second research question, the social use of technology predicted both online and mixed-mode friendship quality but not the offline one. These are logical results because the use of technology is a necessary component of the first two types of friendships and does not directly affect contacts that happen mostly in real life. Moreover, online friendship quality lowered life satisfaction and offline raised it. These results largely confirmed previous studies and nuanced their conclusions (Quinn & Oldmeadow, 2013; Valkenburg & Peter, 2007; Valkenburg & Peter, 2009). One recent study on 1,890 German preadolescents and adolescents, aged 10 to 18, concluded that frequency of contact predicted friendship quality (Glüer & Lohaus, 2016). The present study confirmed these results and showed that the frequency of online contact also increased friendship quality. While Internet communication increases friendship quality,

it does not affect all types of friendships. In today's world, most friendships are mixed-mode, sustained both in real and online worlds. Online friends are sources of valued connections for children as well. However, there are still offline friends, which remain important and unaffected by the spread of technology. These findings also negate the assumption that the use of technology correlates with lower quality offline contacts (Twenge, Martin, & Campbell, 2018). Technology does not replace friends, it even fosters human connections but not with real-life friends. It is noteworthy that the quality of online friendships was lower than mixed-mode and offline ones, which confirmed previous findings (Antheunis, Valkenburg, & Peter, 2012). The online friendships, while being important connections for children, predicted lesser life satisfaction. This is a previously unreported relationship. Hence, there is an indirect negative effect of the social use of ICTs on life satisfaction by increasing online friendship quality. Perhaps physical contact and face-to-face emotional support are necessary factors, which make friendships increase life satisfaction. The present study showed that a happy life requires friendships in real life, which is in line with previous publications (Diener et al., 2018; Helliwell, Huang, & Wang, 2017; Raboteg-Saric & Sakic, 2014).

In response to the third research question, the social use of technology predicted both higher materialism and humanism. Contrary to expectations, materialism did not predict lower friendship quality or life satisfaction. Advertising exposure associated with the social use of ICTs could possibly explain the rise of materialism. Moreover, previous literature contributed both the theoretical model and empirical data to support these findings (Behal & Soni, 2018; Lee, Chang, Lin, & Cheng, 2014; Opree, Buijzen, van Reijmersdal, & Valkenburg, 2014; Vandana & Lenka, 2014). The lack of effects of materialism could be explained with the fact that this is a value, which is generally discouraged in Polish culture. The children who indicated higher materialism could still be protected from its negative effects because Polish culture provides a strong network of family support and encourages seeking friendships. Therefore, materialist children can never completely neglect human relationships, necessary for a happy life, due to the Polish cultural model.

Humanism predicted a higher quality of all types of friends and life satisfaction. The rise or effects of humanism have not been observed directly before. Yet there is

research on similar concepts, which provided some backing for the conclusions from the present study. For instance, allocentrism predicted better friendships (Morry, 2005). Moreover, previous work showed that focus on relationships increased well-being (Casas, Gonzalez, Figuer, & Coenders, 2004; Linley et al., 2004 unpublished, cited in Proctor, Linley, & Maltby, 2009). Those who are most willing to invest in lifelong friendships, help others, speak out against injustice and be kind are those who have the best friendships and those who are happiest in life. In general, the social use of ICTs increased humanism and thus indirectly increased the quality of friendships and life satisfaction.

In response to the fourth research question, materialism lowered humanism. Therefore, the distinction made in the original Boski's (1999) research and conflict reported in Burroughs and Rindfleisch (2002) made sense in the context of the current project. The children who were more focused on pursuing expensive things, brands, and clothes were less likely to help without expecting anything in return, invest in lifelong friendships, be kind, or speak out against injustice. Moreover, these results replicated findings that materialism correlated negatively with kindness to others (Zawadzka & Lewandowska-Walter, 2016). This path was important because the social use of ICTs predicted materialism, which then decreased humanism. This effect lowered the positive effect of the social use of ICTs on life satisfaction through humanism and friendships. Finally, the social use of ICTs still had an overall negative effect on life satisfaction as the direct relationship was stronger than the opposite indirect effects.

Limitations and Suggestions for Future Research

This research relied on cross-sectional data. The project gave empirical evidence for correlations and theoretical backing for causations. The long-term influence of social use of ICTs was not established because data was gathered at one point in time. A previous longitudinal study showed that for those with low friendship quality, Internet communication predicted lesser depression, so more satisfying life (Selfhout, Branje, Delsing, ter Bogt, & Meeus, 2009). The effect of online communication on friendship quality for high school students was shown in a longitudinal study before as well (Desjarlais & Willoughby, 2010). These two works strengthen the conclusions from the present study. However, no longitudinal effects of technology use on humanism have

been shown yet. Future research should examine whether all reported relationships are stable over time.

Another recommendation for future research is to examine further the relationship between online friendship quality and life satisfaction. One previous study, based on 149 Australian university students aged 20 on average, indicated that loneliness predicted a higher number of online friends (Hood, Creed, & Mills, 2017). This previous research implied a possible reverse mechanism where loneliness could predict lesser life satisfaction and lead to a higher quality of online friendships. Children and young adults who do not have many friends might turn to the Internet to seek them. Future studies could examine whether loneliness, life satisfaction, and online friendships are related. However, to determine whether online friendship causes less happiness or vice versa, future research should examine this relationship with longitudinal design. The results would indicate whether initial online friendship quality predicted lower life satisfaction in future or whether initial lower life satisfaction predicted higher online friendship quality in the future.

This research explored all the concepts together in one model. The explained variance was around 10% for most of the variables, which indicated possible other factors that should be explored. Future research could focus exclusively on life satisfaction. Self-determination theory argued that life satisfaction depends on certain conditions that have to be met, namely well-being indicators (Opree, Buijzen, & van Reijmersdal, 2016). The indicators such as environmental mastery, personal growth, self-acceptance, autonomy, and positive relationships with others predicted life satisfaction in longitudinal research among 2,983 children aged 8 to 12 (Opree, Buijzen, & van Reijmersdal, 2016). Future research could explore whether these measures of well-being mediate the relationship between the social use of ICTs and life satisfaction.

The final recommendation is to develop a better measure of humanism for children. This study used an unreliable scale based on previous research. One way of going about this project is to create an entirely new explorative survey about humanist life values. Possible questions should also touch on practices rather than focus only on opinions to make answering easier for young children (Borgers, 2003; De Leeuw, 2003).

Scientific and Societal Implications

Despite its limitation, this research was a worthy contribution to scientific publications. First, it brought data from a novel sample, underrepresented in the current scholarship both in terms of age and origin. Discussed theories were based on older populations, therefore the project contributed a replication and confirmation of some theories for younger participants. Moreover, Polish children from a small, medium, and large cities are rarely a focus of scholarly attention. Second, the structural equation modeling allowed checking how the entire dataset fit the model. The project had both a strong theoretical basis and data-driven conclusions. The adequate sample size allowed confirming 11 hypotheses out of 18 and prove the opposite of one hypothesis. The data enriched the understanding of how the social use of ICTs affects life satisfaction, friendships quality, and life values.

The scientific contribution of this research also included the nuanced conceptualization of online, mixed-mode, and offline friendships. While previous research distinguished these categories (Antheunis, Valkenburg, & Peter, 2012; Boute, Wood, & Pratt, 2009), the predictors of closeness to each friend type and their effects on life satisfaction were not specified separately (Quinn & Oldmeadow, 2013; Valkenburg & Peter, 2007; Valkenburg & Peter, 2009). This research showed that while technology predicted higher online and mixed-mode friendship quality, it did not affect offline friendship quality, which increased life satisfaction. Moreover, the quality of online friendships correlated with lowered life satisfaction. This relationship was not found before. The present study confirmed that contemporary Polish children have different types of friendships that should be studied separately.

New technology effects were also seen in the positive influence on life values such as materialism and humanism. The effect was greater for materialism. The present study found only one direct consequence of increased materialism, decreased humanism. Nevertheless, based on previous research, children who grow up to be materialist adults could suffer adverse effects of this life value (Kasser, 2002; Kasser & Linn, 2016). The social use of technology was a predictor of humanist life values. Indeed, those who use technology to communicate more become more likely to value human connection.

Technology, if used for the right purposes, could foster a Polish cultural model, which values relationships.

The research had high social relevance. During the data collection, plenty of parents, teachers, and children expressed their enthusiasm about the topic. The conclusions from the research offer a mix of reassurances and warnings. First of all, smartphones and the Internet play an important positive role in the lives of children. No educators or guardians should completely ban the use of ICTs. Technology allows communication and increases the quality of online and mixed-mode friends. Nevertheless, young technology users should be protected from the influence on life values and life satisfaction. The children should be informed about marketing strategies and the consequences of materialism. Parents should try to talk about and show the importance of humanist life values. The present study found no predictors of high-quality offline friendships, which are necessary for a happy life. While technology does enable friends, the most important relationships are those in real life. Therefore, the final recommendation from this study is that children should be encouraged to use technology to arrange face-to-face meetings and spend time with their peers in real life.

References

Antheunis, M. L., Valkenburg, P. M., & Peter, J. (2012). The quality of online, offline, and mixed-mode friendships among users of a social networking site. *Cyberpsychology: Journal of Psychosocial Research on Cyberspace*, *6*(3). https://doi.org/10.5817/CP2012-3-6

Agosto, D. E., Abbas, J., & Naughton, R. (2012). Relationships and social rules: Teens' social network and other ICT selection practices. *Journal of the American Society for Information Science and Technology*, *63*(6), 1108–1124. https://doi.org/10.1002/asi.22612

Banerjee, R., & Dittmar, H. (2008). Individual differences in children's materialism: The role of peer relations. *Personality and Social Psychology Bulletin*, *34*(1), 17–31. https://doi.org/10.1177/0146167207309196

Behal, M., & Soni, P. (2018). Media use and materialism: A comparative study of impact of television exposure and Internet indulgence on young adults. *Management and Labour Studies*, *43*(4), 247–262. https://doi.org/10.1177/0258042X18791613

Berezowska, J., Kamińska, M., Kwiatkowska, M., Niewiadomska, E., Szczepańska, B., Wegner, M. (2010). *Społeczeństwo informacyjne w Polsce. Wyniki badań statystycznych z lat 2006-2010 [Information society in Poland. Results of statistical studies in the years 2006-2010]*. Warsaw, Poland: Główny Urząd Statystyczny. Retrieved from: https://stat.gov.pl/cps/rde/xbcr/gus/nts_spolecz_inform_w_polsce_2006-2010.pdf

Boguszewski, R. (2016). Młodzież 2016. Aspiracje, dążenia i plany życiowe młodzieży. [Youth 2016. Aspirations, endeavors and life plans of the youth]. Warsaw, Poland: CBOS. Retrieved from https://www.cinn.gov.pl/portal?id=15&res_id=1150305

Borgers, N. (2003). *Questioning children's responses* (Doctoral dissertation). Utrecht University, Utrecht, The Netherlands.

Boski, P. (2008). Five meanings of integration in acculturation research. *International Journal of Intercultural Relations*, *32*(2), 142-153. https://doi.org/10.1016/j.ijintrel.2008.01.005

Boski, P. (2006). Humanism-materialism: Centuries-long Polish cultural origins and 20 years of research in cultural psychology. In U. Kim, K. Yang, & K. Hwang (Eds.) *Indigenous and Cultural Psychology: Understanding People in Context* (pp. 373–402). New York, NY: Springer.

Boski, P. (1999). Humanizm w kulturze i mentalności Polaków. [Humanism in Polish culture and mentality.] In B. Wojciszke & M. Jarymowicz (Eds.) *Psychologia rozumienia zjawisk społecznych* [Psychological understanding of social phenomena] (pp. 79-121). Warsaw, Poland: Wydawnictwo Naukowe PWN.

Buote, V. M., Wood, E., & Pratt, M. (2009). Exploring similarities and differences between online and offline friendships: The role of attachment style. *Computers in Human Behavior*, *25*(2), 560–567. https://doi.org/10.1016/j.chb.2008.12.022

Burroughs, J., & Rindfleisch, A. (2002). Materialism and well-being: A conflicting values perspective. *Journal of Consumer Research*, *29*(3), 348–370.

Casas, F., Gonzalez, M., Figuer, C., & Coenders, G. (2004). Subjective well-being, values and goal achievement: The case of planned versus by chance searches on the Internet. *Social Indicators Research, 66*(1–2), 123–141. http://dx.doi.org/10.1023/B:SOCI.0000007492.61737.46

Chaplin, L. N., & John, D. R. (2010). Interpersonal influences on adolescent materialism: A new look at the role of parents and peers. *Journal of Consumer Psychology*, *20*(2), 176–184. https://doi.org/10.1016/j.jcps.2010.02.002

De Leeuw, E. (2003). *Questioning children in surveys (Report to the statistical information and monitoring programme on child labour of the International Labour Office's internal programme on the elimination of child labour)*. Utrecht, the Netherlands: Department of methodology and statistics.

Desjarlais, M., & Willoughby, T. (2010). A longitudinal study of the relation between adolescent boys and girls' computer use with friends and friendship quality: Support for the social compensation or the rich-get-richer hypothesis? *Computers in Human Behavior*, *26*(5), 896–905. https://doi.org/10.1016/j.chb.2010.02.004

Diener, E., Biswas-Diener, R., Halpern, D., Vitterso, J., Reis, H., Scollon, C., … Helliwel, J. (2018). Social well-being: Research and policy recommendations. In

J. F. Helliwell, R. Layard, & J. Sachs (Eds.), *Global happiness policy report: 2018* (pp. 129–159). New York, NY: Global Happiness Council.

Diener, E., & Diener, M. (1995). Cross-cultural correlates of life satisfaction and self-esteem. *Journal of Personality and Social Psychology*, *68*(4), 653–663. https://doi.org/10.1037/0022-3514.68.4.653

Duffy, M. K., & Shaw, J. D. (2000). The Salieri syndrome: Consequences of envy in groups. *Small Group Research*, *31*(1), 3–23. https://doi.org/10.1177/104649640003100101

Glüer, M., & Lohaus, A. (2016). Participation in social network sites: Associations with the quality of offline and online friendships in German preadolescents and adolescents. *Cyberpsychology: Journal of Psychosocial Research on Cyberspace*, *10*(2). https://doi.org/10.5817/CP2016-2-2

Gontarczuk, W., Jaszkowski, M., Kulczycka, J., Pudłowski, T., & Skrzypek, S. (2008). *Społeczeństwo informacyjne w Polsce. Wyniki badań statystycznych z lat 2004–2007 [Information society in Poland. Results of statistical studies in the years 2004–2007]*. Warsaw, Poland: Główny Urząd Statystyczny. Retrieved from: https://stat.gov.pl/cps/rde/xbcr/gus/NTS_spoleczenstwo_informacyjne_w_Polsce_2004_2007.pdf

Gumiński, M., Huet, M., Jacykowska, M., Kwiatkowska, M., Mordan, P., & Orczykowska, M. (2018). *Społeczeństwo informacyjne w Polsce. Wyniki badań statystycznych z lat 2013–2017 [Information society in Poland. Results of statistical studies in the years 2006–2010]*. Warsaw, Poland: Główny Urząd Statystyczny. Retrieved from: https://www.telepolis.pl/grafika/newsy/2017-12/spoleczenstwo_informacyjne_w_polsce._wyniki_badan_statystycznych_z_lat_2013-2017.pdf

Helliwell, J., Huang, H., & Wang, S. (2017). The social foundations of world happiness. In J. Helliwell, L. Layard, & J. Sacks (Eds.), *World happiness report*. (pp. 8–47). Retrieved from http://worldhappiness.report/wp-content/uploads/sites/2/2017/03/HR17.pdf

Hofstede, G., Hofstede, G. J., & Minkov, M. (2010). *Cultures and organizations: Software of the mind: Intercultural cooperation and its importance for survival.* New York, NY: McGraw-Hill.

Holloway, D., Green, L., & Livingstone, S. (2013). *Zero to eight. Young children and their Internet use*. LSE, London, UK: EU Kids Online. Retrieved from: https://ro.ecu.edu.au/cgi/viewcontent.cgi?referer=https://scholar.google.nl/&httpsredir=1&article=1930&context=ecuworks2013

Hood, M., Creed, P. A., & Mills, B. J. (2018). Loneliness and online friendships in emerging adults. *Personality and Individual Differences*, *133*, 96–102. https://doi.org/10.1016/j.paid.2017.03.045

Hooper, D., Coughlan, J., & Mullen, M. (2008). Structural equation modelling: Guidelines for determining model fit. *Electronic Journal of Business Research Methods*, *6*(1), 53–60. https://doi.org/10.21427/D7CF7R

Huang, C. (2010). Internet use and psychological well-being: A meta-analysis. *Cyberpsychology, Behavior, and Social Networking*, *13*(3), 241–249. https://doi.org/10.1089/cyber.2009.0217

Huebner, E. S. (1994). Preliminary development and validation of a multidimensional life satisfaction scale for children. *Psychological Assessment*, *6*(2), 149–158.

Jordan, A., & Prendella, K. (2019). The invisible children of media research. *Journal of Children and Media*, *13*(2), 235–240. https://doi.org/10.1080/17482798.2019.1591662

Kamieniecki, W., Bochenek, M., Tanaś, M., Wrońska, A., Lange, R., Fila, M., … Konopczyński, F. (2017). *Nastolatki 3.0: Raport z badania [Teens 3.0: Report from the study]*. Warsaw, Poland: Nask – Instytut Badawczy.

Kasser, T. (2002). *The high price of materialism*. Cambridge, MA: MIT Press.

Kasser, T., & Linn, S. (2016). Growing up under corporate capitalism: The problem of marketing to children, with suggestions for policy solutions. *Social Issues and Policy Review*, *10*(1), 122-150. https://doi.org/10.1111/sipr.12020

Kasser, T., & Ryan, R. M. (2001). Be careful what you wish for: Optimal functioning and the relative attainment of intrinsic and extrinsic goals. In P. Schmuck & K. M.

Sheldon (Eds.), *Life goals and well-being: Towards a positive psychology of human striving* (pp. 116–131). Goettingen, Germany: Hogrefe & Huber.

Kirwil, L. (2011). *Polskie dzieci w Internecie. Zagrożenia i bezpieczeństwo - część 2. Częściowy raport z badań EU Kids Online II przeprowadzonych wśród dzieci w wieku 9-16 lat i ich rodziców [Polish children in the Internet. Risks and safety- part 2. Partial report from EU Kids Online II study conducted among children aged 9 to 16 and their parents]*. Warsaw, Poland: SWPS – EU Kids Online - PL.

Kline, R. B. (2011). *Methodology in the social sciences. Principles and practice of structural equation modeling (3rd ed.).* New York, NY: Guilford Press.

Lee, Y.-K., Chang, C.-T., Lin, Y., & Cheng, Z.-H. (2014). The dark side of smartphone usage: Psychological traits, compulsive behavior and technostress. *Computers in Human Behavior*, *31*, 373–383. https://doi.org/10.1016/j.chb.2013.10.047

Marsden, P. V., & Campbell, K. E. (1984). Measuring tie strength. *Social Forces, 63*(2), 482–501.

McHoskey, J. W. (1999). Machiavellianism, intrinsic versus extrinsic goals, and social interest: A self-determination theory analysis. *Motivation and Emotion*, *23*(4), 267–283. http://dx.doi.org/10.1023/A:1021338809469

Mobile is spicy. Przegląd trendów na rynku mobilnym. [Mobile is spicy. The trend overview on mobile market.] (2017). *Spicy Mobile,* Retrieved from https://www.spicymobile.pl/assets/doc/MOBILE_IS_SPICY_2017.pdf

Morry, M. M. (2005). Allocentrism and friendship satisfaction: The mediating roles of disclosure and closeness. *Canadian Journal of Behavioural Science / Revue Canadienne Des Sciences Du Comportement, 37*(3), 211–222. https://doi.org/10.1037/h0087258

Norton's my first device report (2018). *Norton By Symantec,* Retrieved from: http://www.educational.rai.it/materiali/pdf_articoli/42413.pdf

Opree, S. J., Buijzen, M., & van Reijmersdal, E. A. (2016). The impact of advertising on children's psychological wellbeing and life satisfaction. *European Journal of Marketing*, *50*(11), 1975–1992. https://doi.org/10.1108/EJM-06-2015-0393

Opree, S.J., Buijzen, M., van Reijmersdal, E.A. & Valkenburg, P. M. (2014). Children's advertising exposure, advertised product desire, and materialism: A longitudinal

study. *Communication Research*, *41*(5), 717–735. https://doi.org/10.1177/0093650213479129

Opree, S. J., Buijzen, M., van Reijmersdal, E. A., & Valkenburg, P. M. (2011). Development and validation of the Material Values Scale for children (MVS-c). *Personality and Individual Differences*, *51*(8), 963–968. https://doi.org/10.1016/j.paid.2011.07.029

Orben, A., & Przybylski, A. K. (2019a). Screens, teens, and psychological well-being: Evidence from three time-use-diary studies. *Psychological Science*, *30*(5), 682–696. https://doi.org/10.1177/0956797619830329

Orben, A., & Przybylski, A. K. (2019b). The association between adolescent well-being and digital technology use. *Nature Human Behaviour*, *3*(2), 173–182. https://doi.org/10.1038/s41562-018-0506-1

Piko, B. F. (2006). Satisfaction with life, psychosocial health and materialism among Hungarian youth. *Journal of Health Psychology*, *11*(6), 827–831. https://doi.org/10.1177/1359105306069072

Proctor, C. L., Linley, P. A., & Maltby, J. (2009). Youth life satisfaction: A review of the literature. *Journal of Happiness Studies, 10*(5), 583–630. https://doi.org/10.1007/s10902-008-9110-9

Przybylski, A. K., & Weinstein, N. (2017). A large-scale test of the Goldilocks hypothesis: Quantifying the relations between digital-screen use and the mental well-being of adolescents. *Psychological Science*, *28*(2), 204–215. https://doi.org/10.1177/0956797616678438

Quinn, S., & Oldmeadow, J. A. (2013). Is the *i* generation a 'we' generation? Social networking use among 9- to 13-year-olds and belonging. *British Journal of Developmental Psychology*, *31*(1), 136–142. https://doi.org/10.1111/bjdp.12007

Raboteg-Saric, Z., & Sakic, M. (2014). Relations of parenting styles and friendship quality to self-esteem, life satisfaction and happiness in adolescents. *Applied Research in Quality of Life*, *9*(3), 749–765. https://doi.org/10.1007/s11482-013-9268-0

Rozkosz, E. A., Siuda, P., Stunża, G. D., Dąbrowska, A. J., Klimowicz, M., Kulczycki, E., … Stachura, K. (2014). Information and media literacy of Polish children

according to the results of "Children of the Net" and "Children of the Net 2.0" Studies. In S. Kurbanoğlu, S. Špiranec, E. Grassian, D. Mizrachi, & R. Catts (Eds.), *Information Literacy. Lifelong Learning and Digital Citizenship in the 21st Century* (Vol. 492, pp. 263–273). https://doi.org/10.1007/978-3-319-14136-7_28

Selfhout, M. H. W., Branje, S. J. T., Delsing, M., ter Bogt, T. F. M., & Meeus, W. H. J. (2009). Different types of Internet use, depression, and social anxiety: The role of perceived friendship quality. *Journal of Adolescence*, *32*(4), 819–833. https://doi.org/10.1016/j.adolescence.2008.10.011

Stańczak, J., & Znajewska, A. (2017). *Ludność. Stan i struktura w przekroju terytorialnym stan w dniu 30 VI 2017 r. [Population in Poland. Size and structure by territorial division as of June 30, 2017.]* Warsaw, Poland: GUS, Departament Badań Demograficznych i Rynku Pracy. Retrieved from https://stat.gov.pl/files/gfx/portalinformacyjny/pl/defaultaktualnosci/5468/6/22/1/ludnosc._stan_i_struktura_w_przekroju_terytorialnym._stan_w_dniu_30.06.2017.pdf

Tobacyk, J., Babin, B., Attaway, J., Socha, S., Shows, D., & James, K. (2011). Materialism through the eyes of Polish and American consumers. *Journal of Business Research*, *64*(9), 944–944. https://doi.org/10.1016/j.jbusres.2010.11.016

Twenge, J. M., Martin, G. N., & Campbell, W. K. (2018). Decreases in psychological well-being among American adolescents after 2012 and links to screen time during the rise of smartphone technology. *Emotion*, *18*(6), 765–780. https://doi.org/10.1037/emo0000403

Valkenburg, P. M., & Peter, J. (2007). Preadolescents' and adolescents' online communication and their closeness to friends. *Developmental Psychology*, *43*(2), 267–277. https://doi.org/10.1037/0012-1649.43.2.267

Valkenburg, P. M., & Peter, J. (2009). Social consequences of the Internet for adolescents: A decade of research. *Current Directions in Psychological Science*, *18*(1), 1–5. https://doi.org/10.1111/j.1467-8721.2009.01595.x

Valkenburg, P. M., & Peter, J. (2013). The differential susceptibility to media effects model. *Journal of Communication*, *63*(2), 221–243. https://doi.org/10.1111/jcom.12024

Vandana, & Lenka, U. (2014). A Review on the role of media in increasing materialism among children. *Procedia - Social and Behavioral Sciences*, *133*, 456–464. https://doi.org/10.1016/j.sbspro.2014.04.212

Wajcman, J., Bittman, M., Jones, P., Johnstone, L., & Brown, J. (2007). *The impact of the mobile phone on work/life balance*. Canberra, Australia: Australian Mobile Telecommunications Association & Australian National University. Retrieved from: https://www.researchgate.net/publication/303168895_The_impact_of_the_mobile_phone_on_worklife_balance

Wójcik, S., Wojtasik, L., Kępka, M., Makaruk, K., Dziemidowicz, E., Nawarenko, A., & Podlewska, J. (2019). *Patocontent w Internecie. Raport o problemie [Patho-content in the Internet. Report about the problem].* Warsaw, Poland: Fundacja Dajemy Dzieciom Siłę. Retrevied from https://www.rpo.gov.pl/sites/default/files/Raport%20z%20bada%C5%84%20nastolatk%C3%B3w%20nt.%20patotre%C5%9Bci.pdf

Zawadzka, A. M. (2013). Aspiracje materialistyczne młodzieży w kontekście preferowanych wartości i dobrostanu. [Materialist aspirations of the youth in the context of preferred values and welfare.] *Czasopismo Psychologiczne, 19*(1), 7–16. Retrieved from https://www.researchgate.net/profile/Anna_Maria_Zawadzka/publication/266475179_Aspiracje_materialistyczne_mlodziezy_w_kontekscie_preferowanych_wartosci_i_dobrostanu/links/5432d1b70cf22395f29c5f9c/Aspiracje-materialistyczne-mlodziezy-w-kontekscie-preferowanych-wartosci-i-dobrostanu.pdf

Zawadzka, A. M., & Lewandowska-Walter, A. (2016). Wartości, style przywiązania i samoocena a materializm nastolatków [Values, attachment styles and self-value and teen's materialism]. *Polskie Forum Psychologiczne*, *XXI*(3). https://doi.org/10.14656/PFP20160305

Zilka, G. C. (OnlineFirst). Always with them: smartphone use by children, adolescents, and young adults—characteristics, habits of use, sharing, and satisfaction of needs. *Universal Access in the Information Society*. https://doi.org/10.1007/s10209-018-0635-3

Appendix A Figures

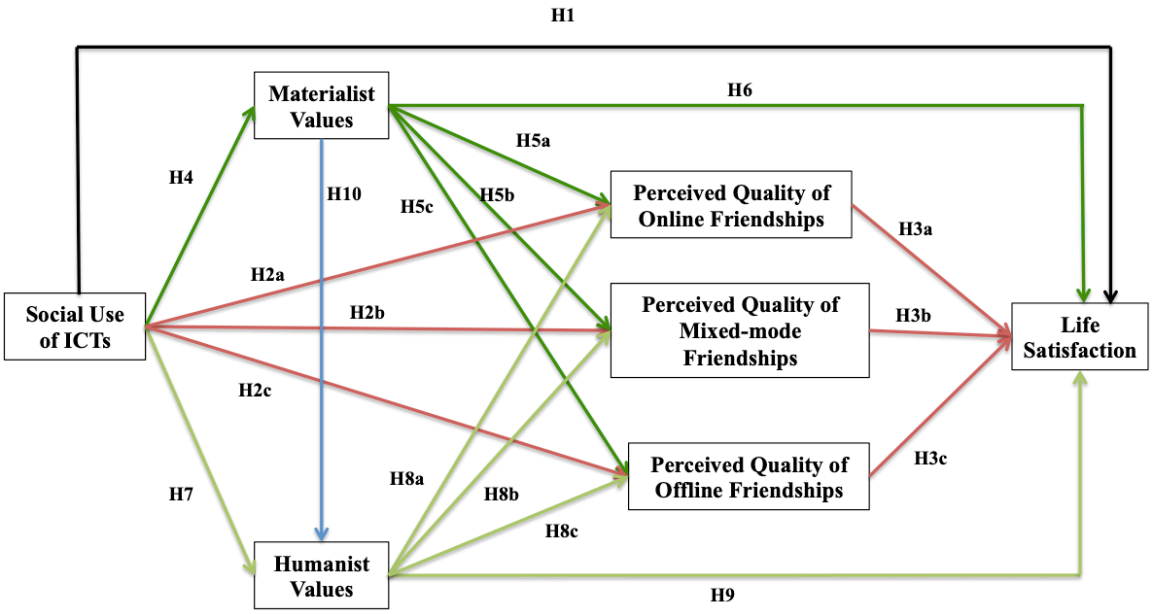
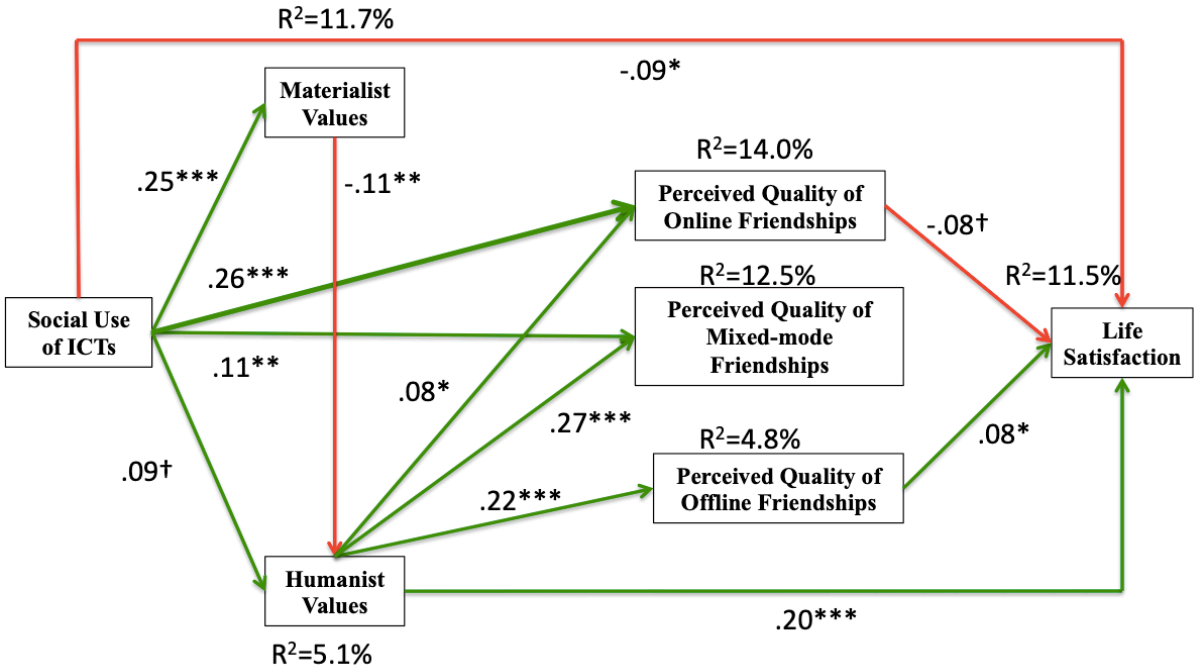


Figure 1. The visualization of relations between social use of ICTs, perceived quality of friendships, materialist values, humanist values, and life satisfaction.



Note:
***p<.001
**p<.01
*p<.05
†p<.1

Figure 2. The model of relations between the social use of ICTs, perceived quality of friendships, materialist values, humanist values, and life satisfaction. The standardized weighted regression coefficients are close to the lines, while the squared multiple correlations are above the dependent variables.

Appendix B English Version of the Survey Questionnaire

Hello!

As you know, I am Bartek. I would like you to complete this survey. Your opinions and knowledge matter a lot to me. In this booklet, you will find a set of questions about your media use, friendships, and happiness. Please note that questions are printed on both sides of the paper.

Remember, there are no right or wrong answers. Also, this is NOT a part of your regular class. You will not be graded on these questions. Nobody will get to know your answers either. The survey is completely anonymous.

You can choose not to fill out this survey. At any point of filling out the survey you can stop and start doing something else. In this case, put your booklet on the top of the bench. Please quietly start doing something else. I would really like though if you decided to fill the survey out!

It does not take long to finish the survey. It should take just about 20 minutes. Do not worry if you take a little bit more time or a little bit less time.

Bartek Żerebecki

This page should be blank.

First, I would like to know you a bit better. Please answer the following questions by putting a cross within a box that reflects your answer. If you make a mistake, circle the wrong box and tick the correct one. If you have any questions now or during the process, please raise your hand.

1. How old are you?

□ 10 Years old
□ 11 Years old
□ 12 Years old
□ 13 Years old
□ Other. Write it here ____

2. Are you a girl or a boy?

□ Girl
□ Boy

3. Which grade do you attend?

□ 4
□ 5
□ 6

4. How many people live in your home, including yourself, your siblings, parents and other guardians?

□ 2 or less
□ 3
□ 4
□ 5
□ 6 or more

Now, I have some questions about the devices on which you can access the Internet at home. These things could belong to you, your siblings, your parents or other people at home.

5. How many desktop computers are there in your home?

□ 0
□ 1
□ 2
□ 3
□ 4 or more

6. How many laptops are there in your home?

□ 0
□ 1
□ 2
□ 3
□ 4 or more

7. How many tablets are there in your home?

□ 0
□ 1
□ 2
□ 3
□ 4 or more

8. How many smartphones are there in your home?

□ 0
□ 1
□ 2
□ 3
□ 4 or more

This section is about how often you use these devices at home during a regular week. Remember that each week has seven days. On Monday to Friday you go to school, on Saturday and Sunday you do not. Please think about a regular week and both week and weekend days when answering the next questions

9. How often do you use a desktop computer during an entire week?

□ Very often
□ Often
□ Sometimes
□ Almost never
□ Never

10. How often do you use a laptop during an entire week?

□ Very often
□ Often
□ Sometimes
□ Almost never
□ Never

11. How often do you use a tablet during an entire week?

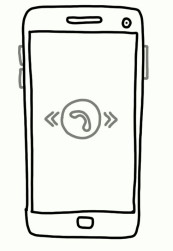
□ Very often
□ Often
□ Sometimes
□ Almost never
□ Never

12. How often do you use a smartphone during an entire week?

□ Very often
□ Often
□ Sometimes
□ Almost never
□ Never

Next, I would like to know how often you use these devices and their applications to talk to one person. If you do not know the application I am asking about, you may cross the box "never." Similar to before, I would like to know how often you do the following throughout a regular week.

13. How often do you call during an entire week?

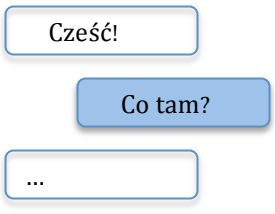


- □ Very often
- □ Often
- □ Sometimes
- □ Almost never
- □ Never

14. How often do you video chat during an entire week?

- □ Very often
- □ Often
- □ Sometimes
- □ Almost never
- □ Never

15. How often do you text during an entire week?



- □ Very often
- □ Often
- □ Sometimes
- □ Almost never
- □ Never

16. How often do you use Messenger during an entire week?

- ☐ Very often
- ☐ Often
- ☐ Sometimes
- ☐ Almost never
- ☐ Never

17. How often do you use WhatsApp during an entire week?

- ☐ Very often
- ☐ Often
- ☐ Sometimes
- ☐ Almost never
- ☐ Never

18. How often do you use Snapchat during an entire week?

- ☐ Very often
- ☐ Often
- ☐ Sometimes
- ☐ Almost never
- ☐ Never

19. How often do you use e-mail during an entire week?

- ☐ Very often
- ☐ Often
- ☐ Sometimes
- ☐ Almost never
- ☐ Never

20. How often do you send DM messages on Instagram during an entire week?

- ☐ Very often
- ☐ Often
- ☐ Sometimes
- ☐ Almost never
- ☐ Never

Now, the questions focus on talking with many people at once. The questions are about how often you use the devices to post, comment, share, and like on social media. Again, I am asking about a regular week. If you do not know the application I am asking about, you may cross the box "never."

21. How often do you use Facebook to post, comment, or like during an entire week?

- □ Very often
- □ Often
- □ Sometimes
- □ Almost never
- □ Never

22. How often do you use Instagram to post, comment, or like during an entire week?

- □ Very often
- □ Often
- □ Sometimes
- □ Almost never
- □ Never

23. How often do you use YouTube to post, comment, or like during an entire week?

- □ Very often
- □ Often
- □ Sometimes
- □ Almost never
- □ Never

Good job, you are half way through! Now, I will be asking about your friendships. I want to know about the people you like and spend time with. It can be both colleagues and best friends. I will be asking about three different types of friends: those with whom interact only through the Internet, those with whom you interact only in real life, and those with whom you interact through both ways.

The next three questions are about your **online friends**. Online friends are friends with whom you interact mostly on the Internet. You rarely or never see them in real life. For instance, it could be people you only follow on Instagram or exchange messages but never actually met.

24. Do you feel close with your online friends?

□ Yes, very much
□ Yes, a little
□ No, not really
□ No, not at all

25. Do you trust your online friends?

□ Yes, very much
□ Yes, a little
□ No, not really
□ No, not at all

26. Are your online friends important to you?

□ Yes, very much
□ Yes, a little
□ No, not really
□ No, not at all

Next, I want to know about your **offline friends**. Offline friends are friends with whom you interact mostly in the real life and almost never on the Internet. For instance, it could be a person you only meet at school or when you play outside but you do not have any contact through a phone or the Internet.

27. Do you feel close with your offline friends?

□ Yes, very much
□ Yes, a little
□ No, not really
□ No, not at all

28. Do you trust your offline friends?

□ Yes, very much
□ Yes, a little
□ No, not really
□ No, not at all

29. Are your offline friends important to you?

□ Yes, very much
□ Yes, a little
□ No, not really
□ No, not at all

This last set of questions about friendship is about **mixed type friends**. Mixed type friends are friends with whom you interact both on the Internet and in real life. For instance, it could be your classmates with whom you talk online about homework but also meet at school or in the free time.

30. Do you feel close with your mixed type friends?

□ Yes, very much
□ Yes, a little
□ No, not really
□ No, not at all

31. Do you trust your mixed type friends?

□ Yes, very much
□ Yes, a little
□ No, not really
□ No, not at all

32. Are your mixed type friends important to you?

□ Yes, very much
□ Yes, a little
□ No, not really
□ No, not at all

Now, I will ask you questions about how satisfied you are. Remember, this is an anonymous survey. Nobody will know what you chose. There are no correct answers. Just be honest!

33. Are you happy with your life?

□ Yes, very happy
□ Yes, little happy
□ No, not so happy
□ No, not happy

34. Are you happy with your home?

□ Yes, very happy
□ Yes, little happy
□ No, not so happy
□ No, not happy

35. Are you happy with your parents?

□ Yes, very happy
□ Yes, little happy
□ No, not so happy
□ No, not happy

36. Are you happy with your friends?

□ Yes, very happy
□ Yes, little happy
□ No, not so happy
□ No, not happy

37. Are you happy with your class?

□ Yes, very happy
□ Yes, little happy
□ No, not so happy
□ No, not happy

38. Are you happy with school?

□ Yes, very happy
□ Yes, little happy
□ No, not so happy
□ No, not happy

39. Are you happy with yourself?

□ Yes, very happy
□ Yes, little happy
□ No, not so happy
□ No, not happy

40. Are you happy?

□ Yes, very happy
□ Yes, little happy
□ No, not so happy
□ No, not happy

You have finished most of the survey. You are doing well! The next questions ask your opinion about possessions, brands, and clothes.

41. Do you think it is important to own expensive things?

□ Yes, very much
□ Yes, a little
□ No, not really
□ No, not at all

42. Do you think it is important to own expensive brands?

□ Yes, very much
□ Yes, a little
□ No, not really
□ No, not at all

43. Does buying expensive things make you happy?

□ Yes, very much
□ Yes, a little
□ No, not really
□ No, not at all

44. Would you be happier if you owned more clothes that are expensive?

□ Yes, very much
□ Yes, a little
□ No, not really
□ No, not at all

45. Do you like children who have expensive things more than you like other children?

□ Yes, very much
□ Yes, a little
□ No, not really
□ No, not at all

46. Do you like children who have a lot of things more than you like other children?

□ Yes, very much
□ Yes, a little
□ No, not really
□ No, not at all

Next, I want to know what you think about treating other people. Again, there are no right or wrong answers.

47. Do you think having lasting friends is important?

□ Yes, very much
□ Yes, a little
□ No, not really
□ No, not at all

48. Do you think helping others without expecting anything in return is important?

□ Yes, very much
□ Yes, a little
□ No, not really
□ No, not at all

49. Do you think speaking out when your friends are treated unjustly is important?

□ Yes, very much
□ Yes, a little
□ No, not really
□ No, not at all

50. Do you think being kind to your family members is important?

□ Yes, very much
□ Yes, a little
□ No, not really
□ No, not at all

51. Do you think being kind to your friends is important?

□ Yes, very much
□ Yes, a little
□ No, not really
□ No, not at all

52. Do you think being kind to people you do not know is important?

□ Yes, very much
□ Yes, a little
□ No, not really
□ No, not at all

Congratulations! The last set of questions is about your opinion on this survey.

53. Was this questionnaire easy?

□ Yes, very much
□ Yes, a little
□ No, not really
□ No, not at all

54. Did you like this questionnaire?

□ Yes, very much
□ Yes, a little
□ No, not really
□ No, not at all

55. Do you have additional comments? If yes, please write them in the box below. If no, please leave it blank.

Thank you very much for your participation. Your opinions matter a lot to me. You helped me conduct a research for the university!

Appendix C Modifications of the Model

The untrimmed model had 88 parameters. The relationships included all the relationships from the hypotheses and all possible relationships between each control variable and each main variable. All the control variables were also correlated with each other. The Chi-Square value was 70.15, $p = .000$ with 3 degrees of freedom. The ratio of the Chi-Square value to degrees of freedom was 23.38, which is much higher than recommended 5.00 (Hooper, Coughlan, & Mullen, 2008). The CFI was .93, which is in line with Kline's (2011) recommendation that CFI should be larger than .90. The RMSEA was .20, which did no indicate a good data fit because it exceeded the recommended value of .08 (Kline, 2011). The following relationships were excluded from the model because they were not statistically significant:

- social use of ICTs and perceived quality of offline friendships, $\beta = .06$, $p = .213$,
- perceived quality of mixed-mode friendships and life satisfaction, $\beta = -.01$, $p = .872$,
- materialism and perceived quality of online friendships, $\beta = .04$, $p = .282$,
- materialism and perceived quality of mixed-mode friendships, $\beta = -.03$, $p = .457$,
- materialism and perceived quality of offline friendships, $\beta = -.01$, $p = .745$,
- general use of ICTs and perceived quality of offline friendships, $\beta = -.07$, $p = .116$,
- general use of ICTs and life satisfaction, $\beta = -.00$, $p = .957$,
- number of devices per person and perceived quality of online friendships, $\beta = -.02$, $p = .641$,
- number of devices per person and perceived quality of mixed-mode friendships, $\beta = .03$, $p = .549$,
- number of devices per person and perceived quality of offline friendships, $\beta = -.05$, $p = .290$,
- number of devices per person and materialism, $\beta = .01$, $p = .773$,
- number of devices per person and humanism, $\beta = .02$, $p = .608$,
- number of devices per person and life satisfaction, $\beta = .01$, $p = .861$,
- age and perceived quality of mixed-mode friendships, $\beta = -.04$, $p = .292$,
- age and perceived quality of offline friendships , $\beta = .01$, $p = .780$,
- age and materialism, $\beta = -.02$, $p = .518$,

- age and humanism, β = .02, *p* = .625,
- gender and perceived quality of offline friendships , β = .06, *p* = .149,
- location middle city and the perceived quality of mixed-mode friendships, β = -.09, *p* = .107,
- location middle city and the perceived quality of offline friendships, β = -.01 *p* = .877,
- location middle city and materialism, β = .03, *p* = .575,
- location large city and the perceived quality of mixed-mode friendships, β = -.06, *p* = .240,
- location large city and the perceived quality of offline friendships, β = -.06, *p* = .275,
- location large city and materialism, β = -.01, *p* = .847,
- age and gender, β = .06, *p* = .160,
- age and general use of ICTs, β = .03, *p* = .465,
- age and number of devices per person, β = -.03, *p* = .475,
- gender and general use of ICTs, β = .03, *p* = .468,
- gender and number of devices per person, β = .05, *p* = .240,
- location middle city and general use of ICTs, β = .03, *p* = .542,
- location large city and general use of ICTs, β = -.01, *p* = .840.

The following relationships were excluded in the second round of trimming because they were not statistically significant (or close to *p* = .050) after the first set of transformations:

- general use of ICTs and perceived quality of mixed-mode friendships, β = -.07, *p* = .078,
- materialism and life satisfaction, β =.07, *p* = .081.

The statistically significant relationships from the full model had the same direction as the relationship in the trimmed model, only the magnitude of βs differed slightly. Increasing the sample size in future research could make some of the relationships listed above statistically significant.

Appendix D Discussion of the Control Variables

The general use of ICTs positively predicted the social use of ICTs, β = .32, *p* = .000, materialism, β = .12, *p* = .005, humanism, β = -.12, *p* = .005, and the perceived quality of online friendships, β = .08, *p* = .048. Different devices can be used for communication purposes and increasing online friendship quality. Nevertheless, more general use of the devices also meant more advertising exposure, which probably increased materialism. Humanism was also decreased among children who used the ICTs for general purposes more often. The number of devices per person almost certainly increased the social use of ICTs, β = .13 with *p* = .000. Moreover, the lack of effect on other variables showed that minimal amount of devices was enough for friendships and effect on life values and life satisfaction to take place. The age of the participants positively predicted the social use of ICTs, β = .21 with *p* = .000. The older the children, the more likely they were to use the listed communication applications and functions. Additionally, age predicted lowered perceived quality of online friendship, β = -.08 with *p* = .000, and life satisfaction, β = -.15 with *p* = .000. The older children were less satisfied than the younger children, possibly because of the onset of puberty. Girls were likely to use social applications listed more frequently, β = .19 with *p* = .000. They were less materialist, β = -.19 with *p* = .000, and more humanist, β = .09 with *p* = .032. Girls had a lower quality of online friends, β = -.17 with *p* = .000, and a higher of mixed friends, β = .14 with *p* = .000. Finally, they had lower life satisfaction than boys with β = .11 and *p* = .006. Children in the middle city had a lower quality of online friends, β = -.20 with *p* = .000, and life satisfaction, β = -.11 with *p* = .035, than in the small city. Lastly, the children in the large city had a smaller score on the social use of ICTs, β = -.18, *p* = .000, perceived quality of online friendships, β = -.22, *p* = .000, and life satisfaction, β = -.18, *p* = .000, than in the small city. Nevertheless, the children in the large city had higher humanism scores, β = .11 with *p* = .039.