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Identity Formation Patterns and Online Activities in Adolescence

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Abstract

Online activities can provide a wide range of opportunities for young people in dealing with age-related transitions and developmental tasks, such as forming their identity. This study aimed to unravel the associations between adolescent identity formation and online activities, internet skills, and risks. Using a nationally representative sample of Lithuanian adolescents ($N = 549$, mean age 15.5 years, 46.6 % girls), we examined how adolescents, who were classified into distinct identity statuses (achievement, early closure, moratorium, searching moratorium, and diffusion) across two identity domains central to the adolescent experience (educational and interpersonal identity), differ in their pattern of online activities, skills, and risks. The findings highlighted that adolescents in the achievement and searching moratorium statuses could be characterized by a richness of online experiences. Those in the searching moratorium status also had the lowest level of online risks. In contrast, those in the moratorium and diffusion statuses showed lower diversity and richness of online activities. Adolescents in the diffusion status group also had low internet skills. Adolescents in the early closure group showed a mixed profile of online activities.

Keywords: online activities, internet skills, online risks, identity, adolescence.

1. Introduction

Adolescents spend an increasing share of their daily lives engaging in various online activities (Smahel, Machackova, Mascheroni, Dedkova, Staksrud, Ólafsson, Livingstone, & Hasebrink, 2020). By becoming an integral part of adolescent lives, the internet has presumably become an important developmental context for contemporary adolescents. Accordingly, online activities may be related to how adolescents cope with their most important developmental task of identity development (Crocetti, 2017, 2018). Most online activities are relatively free from geographical, cultural, and political boundaries. As such, they can stimulate the exploration of identity aspects that may be constrained in traditional contexts (e.g., ethnic or religious minority identity, gender and sexual identity; Uhls, Ellison, & Subrahmanyam, 2017). This may be especially important for youth with limited opportunities or social skills offline. In addition, online activities remain relatively free from adult supervision, which may facilitate autonomous exploration of identity-relevant content among adolescents (Wängqvist & Frisé, 2016); however, this may only be relevant for adolescents with sufficient internet skills (Hasebrink, Görzig, Haddon, Kalmus, & Livingstone, 2011). A more concerning observation is that the seemingly endless options for identity exploration available online may also result in a sense of identity confusion and distress, which may lead to risk-related activities in online contexts (Wängqvist & Frisé, 2016). A broad range of online activity choices may present challenges for adolescents with an unclear sense of self, that is, those with delayed or stagnant identity formation. Accordingly, the aim of our study is to analyze adolescent online activities in relation to different patterns of identity formation, while also considering adolescents' internet skills and risk-prone internet use.

1.1. Importance of identity formation in adolescence

The adolescent phase is marked by intensive changes in physical, cognitive, and socio-emotional functioning (Crone & Dahl, 2012). Advanced cognitive skills and more complex socio-

IDENTITY FORMATION AND ONLINE ACTIVITIES IN ADOLESCENCE

emotional regulation enable adolescents to form a more elaborate and nuanced view of themselves, their values, preferences, and goals. According to Erikson's (1968) psychosocial theory, these changes provide adolescents with the challenge of building a coherent sense of self by integrating one's goals, values, and preferences, and aligning them with their existing possibilities and social context. A successful transition through this challenge should result in achieving an integrated identity, which ensures a sense of personal continuity and uniqueness, is congruent with one's abilities and needs, and is socially recognized in one's environment. In contrast, difficulties in forming a coherent personal identity may result in identity confusion, which implies a lack of direction in life and low self-awareness (Erikson, 1968).

Based on the classical identity status model (Marcia, 1966), personal identity is formed through two main identity processes: exploration (which entails searching for different alternatives in various life domains) and commitment (which involves investing in specific goals or values as personally meaningful choices; Kroger & Marcia, 2011). Various combinations of these processes result in four identity statuses (Marcia, 1966): achievement (making identity commitments following a period of exploration), foreclosure (making commitments without exploring possible options), moratorium (continuous exploration of alternatives without making any identity commitments), and diffusion (low levels or absence of both exploration and commitment). Longitudinal studies among youth revealed that the share of those in moratorium and identity achievement statuses tends to rise over time, while foreclosure and diffusion statuses decline or fluctuate (Kroger, Martinussen, & Marcia, 2010).

This approach was further elaborated in process-oriented models of identity development (see Meeus, 2011, 2018 for reviews). One of them, the three-factor process-oriented identity model (Crocetti, Rubini, & Meeus, 2008), advanced Marcia's status approach by suggesting that individuals enter adolescence with a set of commitments, primarily based on childhood identifications, which may be re-examined and revised during adolescence. In line with this assumption, the three-factor model considers commitment and distinguishes between two distinct

IDENTITY FORMATION AND ONLINE ACTIVITIES IN ADOLESCENCE

modes of identity exploration: in-depth exploration (a process of thinking about existing commitments) and reconsideration of commitments (a comparison of current commitments with possible alternatives; Crocetti, Rubini, & Meeus, 2008). Based on these three factors, five identity statuses can be identified (Crocetti, Rubini, Luyckx, & Meeus, 2008). The *achievement* status consists of individuals scoring high on commitment and in-depth exploration but low on reconsideration of commitment. The *closure* status includes individuals with moderately high scores on commitment and low scores on both in-depth exploration and reconsideration of commitment. The *moratorium* status consists of individuals exhibiting low commitment, low or moderate on in-depth exploration, and high reconsideration of commitment. The *searching moratorium* status comprises individuals high on commitment, in-depth exploration, and reconsideration of commitment. The *diffusion* status includes young people displaying low commitment, in-depth exploration, and reconsideration of commitment. Thus, the three-factor process-oriented identity model expands the identity status approach and emphasizes a cyclical nature of identity development (Crocetti, 2018).

Notably, the three-factor process-oriented identity model can be applied to study identity in multiple content areas, usually referred to as identity domains, that are relevant for adolescents (Crocetti, 2017). The salience of different identity domains may differ across developmental periods, cultural settings, or populations (Vosylis, Erentaitė, & Crocetti, 2018). For adolescents, the educational (Negru-Subtirica, Pop, & Crocetti, 2017, 2018) and interpersonal domains are usually considered to be the most important (e.g., Albarello, Crocetti, & Rubini, 2018). Accordingly, we focus on these two domains in our study.

While a large number of studies on adolescent identity processes and statuses have explored the role of different developmental contexts, such as family (e.g., Crocetti, Branje, Rubini, Koot, & Meeus, 2017), peers (e.g., Van Doeselaar, Meeus, Koot, & Branje, 2016), and school (e.g., Pop, Negru-Subtirica, Crocetti, Opre, & Meeus, 2016), only a few studies have focused specifically on the role of the online context for adolescent identity development (e.g., Bacchini, De Angelis, &

IDENTITY FORMATION AND ONLINE ACTIVITIES IN ADOLESCENCE

Fanara, 2017; Mannerström, Hietajärvi, Muotka, & Salmela-Aro, 2018). Considering that young people spend an increasing share of their daily lives on the internet (Smahel et al., 2020) and participate in a variety of activities online, the internet could indeed be a context for identity formation processes. Therefore, it would be important to know how adolescents in different identity statuses, based on how they form their identity in both the educational and interpersonal domains, use the internet for various activities online.

1.2. Online activities and adolescent identity

Adolescent online activities. Young people engage in various online activities. There are different approaches to conceptualizing online activities in scientific studies. One way of studying online activities is by analysing specific activities such as reading or watching the news online or listening to music on the internet (e.g., Reinwand, Crutzen, & Zank, 2018, Quintelier & Vissers, 2008). Another approach is to organize online activities into some broader patterns. For example, Erhardt and Freitag (2021) distinguish between information, entertainment, and communication-related activities. However, the patterns or classifications of online activities vary considerably across different studies. Most classifications are based on internet users' motives for engaging in specific activities online (Ito et al., 2009). However, in most cases the data collected does not allow for the differentiation of the precise motives behind certain activities (Erhardt & Freitag, 2021). Moreover, the same online activity can have different implications for adolescent social-emotional functioning (Ito et al., 2009; Erhardt & Freitag, 2021). Therefore, we did not use a particular classification but instead refer to specific online activities.

Activities oriented towards communication, browsing or seeking information, and sharing or creating content activities, as well as interactions related to academic issues and gaming, are considered the most common during adolescence (Hietajärvi, Seppä, & Hakkarainen, 2016). In the last decade, the most popular online activities among European children and adolescents included watching videos, listening to music, communicating with friends and family, visiting social

IDENTITY FORMATION AND ONLINE ACTIVITIES IN ADOLESCENCE

networking sites, and playing online games (Smahel et al., 2020). Schoolwork activities online are also widespread among adolescents, while watching or reading the news or creating new content online is generally less popular. Still, the frequency of online activities varies by country, age, and gender of adolescents (Smahel et al., 2020). Some online activities, such as shopping online (Mishra, Maheswarappa, & Colby 2018), have been less frequently examined among adolescents.

Various activities can provide a wide range of opportunities for young people in dealing with age-related transitions and developmental tasks (Boyd, 2007; Mannerström et al., 2018; Peter & Valkenburg, 2011; Shapka, 2019). For example, adolescents who do not have fulfilling peer friendships offline may use online communication activities to enable social compensation (Selfhout, Branje, Delsing, ter Bogt, & Meeus, 2009). Likewise, adolescents who undergo earlier sexual maturation may engage in online activities to explore sexuality-related content online compared to their later maturing peers (Brown, Halpern, & L'Engel, 2005). Young people, especially early adolescents, report experimenting with self-presentation and self-exploration during various online activities in order to obtain others' feedback (Dunne, Lawlor, & Rowley, 2010; Valkenburg, Schouten, & Peter, 2005). Activities on social networking sites may be particularly closely tied to self-related motives, such as seeing oneself in a positive light, relating to others, feeling competent, and perceiving one's life as continuous (Manzi, Coen, Regalia, Yevenes, Giuliani, & Vignoles, 2018).

A growing number of studies reveal that activities online are also intertwined with aspects of adolescent identity formation. Generally, online activities seem to vary by their relevance for different aspects of adolescent identity formation. For example, those adolescents who are more reflective of their personal preferences and goals (i.e., have a higher self-concept clarity) can be more involved in communication-oriented online activities; whereas those with lower self-concept clarity are more motivated to experiment with various aspects of self online (Davis, 2013). Bacchini et al. (2017) found that the reconsideration of identity commitments and in-depth exploration of them are positively and negatively linked to gaming, respectively. Similarly, Sebre

IDENTITY FORMATION AND ONLINE ACTIVITIES IN ADOLESCENCE

and Miltuze (2021) reported a positive link between avoidance of engaging in identity-relevant issues and gaming. However, no relationship between identity formation and gaming was identified by Mannerström and colleagues (2018). Higher identity exploration without commitment making was related to higher involvement in social networking compared to diffusion (Mannerström et al., 2018). However, the existing findings still do not provide a clear picture of the role of different online activities in the process of adolescent identity formation.

Internet skills and online risks. Online activities require a set of skills that would help adolescents effectively use the internet for their developmental tasks, including identity formation. Skills necessary for using the internet are considered to be different from the skills needed for using the computer (van Deursen, Helsper, & Eynon, 2016). Previously, the concept of internet skills was focused on the technicalities of internet use (e.g., Hargittai & Hsieh, 2012). However, nowadays, the concept has broadened. Researchers suggest that internet skills should cover basic skills that are necessary to use the internet and skills that are important for using online content, for example, safety skills, problem-solving skills, and creative skills (Ferrari, 2012; Gui & Argentin, 2011; van Dijk & van Deursen, 2014). Van Deursen, Courtois, and van Dijk (2014) suggested that internet skills should be described as operational, formal, informational, communicational, and content creation skills. Van Deursen and van Dijk (2010) suggest that better internet skills let people function well online, and it is possible to assume that the performance of different activities would be much better with solid internet skills. Mannerström and colleagues (2018) found that adolescents in the achievement and searching moratorium statuses had the strongest internet skills, while adolescents in the diffusion status had the lowest.

The more varied and developed internet skills adolescents have, the greater variety of online activities they undertake (Hasebrink et al., 2011). Engaging in various online activities may provide adolescents with better opportunities to explore identity-relevant issues and experiment with their identities online. On the other hand, those who experience more opportunities online (engage in more diverse activities, explore new online activities and contents) also experience

IDENTITY FORMATION AND ONLINE ACTIVITIES IN ADOLESCENCE

more risks online (Livingstone & Helsper, 2010), by, for example, engaging with content that is age-inappropriate or damaging. There have been several online risks identified – giving out personal information, seeing inappropriate or hurtful content, being bullied, receiving unwanted comments, meeting online contacts offline (Staksrud & Livingstone, 2009). After the risks associated with personal disclosure, content-related risks (exposure to harmful, unwelcome, or inappropriate content) are the most common (Staksrud & Livingstone, 2009). Research suggests that exposure to harmful online content is associated with lower subjective well-being for adolescents and young adults (Keipi, Oksanen, Hawdon, Näsi, & Räsänen, 2017). Considering that identity diffusion is also characterized by low levels of well-being (Waterman, 2007), it is plausible that higher exposure to harmful online content could also be more typical for adolescents in the diffusion identity status.

Bearing in mind that adolescents spend a lot of time online for various activities, they could face a problem of excessive internet use, which represents a continuum of internet misuse and is described by excessive and poorly controlled preoccupations, behaviors, and urges regarding internet access (Weinstein & Lejoyeux, 2010). Excessive internet use is related to higher school burnout, depressive symptoms, loneliness, anxiety, low self-esteem (Kim, LaRose, & Peng, 2009; Salmela-Aro, Upadyaya, Hakkarainen, Lonka, & Alho, 2017). Further, environmental factors such as higher accessibility of internet cafes and exposure to internet games advertising have had a particularly strong influence on excessive online activities (Chung, Lee, & Lee, 2019). Bacchini et al. (2017) reported negative links between excessive gaming and identity commitments, while the opposite link was identified between gaming and reconsideration of commitments. In addition, Mannerström and colleagues (2018) reported that those high in exploration but not commitment were more involved in excessive internet use than those high in both exploration and commitment. These findings suggest that uncertainty in identity may be linked to more excessive internet use.

1.3. Current study

IDENTITY FORMATION AND ONLINE ACTIVITIES IN ADOLESCENCE

Based on the literature reviewed above, the current study aimed to analyze adolescent online activities in relation to different patterns of identity formation, while considering adolescent internet skills and internet-related risks such as exposure to harmful online content and excessive internet use. Specific online activities covered by the study include searching for information about work and study opportunities, using the internet for schoolwork, reading or watching the news online, discussing political problems online, communicating with family or friends, gaming, listening to music, watching TV shows, and browsing for things to buy or checking what things cost.

We hypothesized that adolescents with an active approach to identity formation (i.e., those in the searching moratorium and achievement status) are more active in all online activities covered by the study. We also hypothesized that adolescents with uncertainty in identity formation (i.e., those in the moratorium or diffusion statuses) have lower internet skills and face a higher risk of exposure to harmful online content and excessive internet use.

This study was conducted in an Eastern European country (i.e., Lithuania). Lithuanian adolescents are among the most active users of the internet, with high levels of digital skills among European adolescents (Smahel et al., 2020). Interestingly, adolescents in Lithuania engage not only in the most popular activities online (such as watching videos, listening to music, visiting social networking sites, and playing online games) but also in activities less popular among adolescents in many other European countries (such as using the internet to watch or read the news; Smahel et al., 2020).

2. Method

2.1. Participants

Participants were drawn from a larger international survey "EU Kids Online" conducted in 19 European countries between 2017 – 2019. From the representative Lithuanian sample ($N = 1,012$), adolescents aged 13 – 17 were selected. Thus, the sample size for the current study included

IDENTITY FORMATION AND ONLINE ACTIVITIES IN ADOLESCENCE

549 adolescents (46.6 % girls) with a mean age of 15.5 years ($SD = 1.43$). Among participants, 73.8% lived with two parents; the rest lived either with one of their parents (22.2%) or with other relatives (4%).

2.2. Procedure

An "EU Kids Online" survey of Lithuanian children was conducted in cooperation with a professional agency between January and May 2018. The participants were recruited using a quota sampling method via households. Eligibility criteria included being a child within the age range of 9 to 17. Quotas to arrive at the proportional distribution of the sample in terms of the living area (urban and rural) and age group (9 - 12 and 13 - 17 years) of the respondents were used. The data were collected via the CAPI (computer-assisted personal interviewing) method in which the participants used tablets and answered the questionnaire at home in the presence of trained interviewers. Informed consent was obtained from the parents and adolescents before data collection.

2.3. Measures

2.3.1. Identity processes

The Lithuanian version (Vosylis et al., 2018) of the Utrecht-Management Identity Commitments Scale (U-MICS; Crocetti, Rubini, & Meeus, 2008) was used to measure identity processes in educational and interpersonal domains. The same 13 items were presented to measure identity commitment (5 items), in-depth exploration (5 items), and reconsideration of commitment (3 items) in the two domains. Sample items include: "My education [or my best friend] gives me security in life" (commitment), "I try to find out a lot about my education [or my best friend]" (in-depth exploration), "I often think it would be better to try to find a different education [or best friend]" (reconsideration of commitment). Items were scored on a scale ranging from 1 (completely untrue) to 5 (completely true). In the current study, Cronbach's alphas were .88 and

IDENTITY FORMATION AND ONLINE ACTIVITIES IN ADOLESCENCE

.87 for commitment; .83 and .81 for in-depth exploration; and .83 and .92 for reconsideration of commitment, in the educational and interpersonal domains, respectively.

2.3.2. *Online activities, internet skills and risks*

The methodology of the "EU Kids Online" survey (for more details, see Smahel et al., 2020) was employed to assess the indicators of online activities, internet skills, exposure to harmful online content, and excessive internet use.

Regarding *online activities*, respondents were asked how often in the last month they have engaged in the following educational, social, or entertainment activities online: looked for information about work and study opportunities, used the internet for schoolwork, looked for news, discussed political or social problems with other people, communicated with family or friends, played games, listened to music, watched TV shows or movies, and browsed for things to buy or checking what things costs. The response scale was: 1 (never), 2 (hardly ever), 3 (at least every week), 4 (daily or almost daily), 5 (several times each day), and 6 (almost all the time).

Internet skills were measured with six items adopted from the Internet Skills Scale (ISS, van Deursen et al., 2016) (e.g. "I know how to save a photo that I find online", "I know which information I should and shouldn't share online "). Items were rated on 5-point Likert scale ranging from 1 (not at all true of me) to 5 (very true of me). Cronbach's alpha was .84.

Exposure to harmful content was assessed by asking participants to indicate how often they had seen six forms of harmful online content in the past year (i.e., "Ways of physically harming or hurting themselves", "Ways of committing suicide", "Ways to be very thin", "Hate messages that attack certain groups or individuals, "Their experiences of taking drugs", "Gory or violent images"). Responses were rated on 4-point Likert scale ranging from 1 (never) to 4 (always). Cronbach's alpha was .81.

Excessive internet use was evaluated by six items that correspond to the criteria of excessive internet use defined by Griffiths (2000). Sample items include: "I have gone without eating or sleeping because of the internet", "I have caught myself using the internet although I'm

IDENTITY FORMATION AND ONLINE ACTIVITIES IN ADOLESCENCE

not really interested". Participants were asked to indicate how often they had experienced this in the past year on 5-point Likert scale ranging from 1 (never) to 5 (daily or almost daily). Cronbach's alpha was .81.

2.4. Data Analyses

First, we estimated missing values for the variables of interest using the Expectation Maximization procedure in SPSS. Overall, 0.15% of data were missing. Little's (1988) Missing Completely at Random (MCAR) test yielded a normed χ^2 (χ^2 / df) of 1.49, which indicates that data were probably missing at random (Bollen, 1989). Second, we screened for outliers on the variables of identity processes as they can affect the results of cluster analysis (Milligan, 1980). We identified ten univariate (i.e., values more than 3 *SD* below or above the mean) and three multivariate (i.e., values with a Mahalanobis distance larger than the critical value of χ^2 (6) = 26.94, $p < .001$) outliers. These 13 participants (i.e., 2.37% of the sample) were omitted from the data. The final sample size of 536 participants ($M_{age}=15.49$, $SD_{age}=1.43$; 46.6% girls) was used in further data analysis. Third, as a preliminary analysis, we computed the frequency of online activities and descriptive statistics and correlations for all study variables. Following this, a cluster analysis was performed to empirically specify identity statuses from the configuration of identity processes (i.e., commitment, in-depth exploration, and reconsideration of commitment) across educational and interpersonal domains. Based on best practices in cluster analysis (Gore, 2000), a two-stage clustering procedure (e.g., Crocetti, Avanzi, Hawk, Fraccaroli, & Meeus, 2014) was used. In the first stage, we conducted a hierarchical cluster analysis using Ward's method of squared Euclidian distances. In the second stage, an iterative k-means clustering procedure was utilized with non-random starting points that were obtained from the hierarchical cluster analysis. Clustered solutions with different numbers of clusters were compared on the bases of three criteria: theoretical meaningfulness, parsimony, and explanatory power (Milligan & Cooper, 1985). Fourth, two Multivariate Analyses of Variance (MANOVAs) were conducted to examine

IDENTITY FORMATION AND ONLINE ACTIVITIES IN ADOLESCENCE

differences in online activities, internet skills, and risks reported by adolescents classified in the identity statuses, with cluster membership as the independent variable and online activities and skills, exposure to harmful content and excessive internet use as the dependent variables.

3. Results

3.1. Preliminary analyses

Descriptive statistics and correlations. The frequencies of online activities are presented in Figure 1. The percent of adolescents who reported at least some engagement in online activities ranged from 20.50% for discussing political and social problems to 95.50% for listening to music. The majority of those, who reported some engagement in online activities, were involved either daily (ranging between 8.70% for discussing political and social problems and 84.80% for listening to music) or at least every week (ranging between 10.70% for listening to music and 35.90% for buying things online or checking the internet for the prices).

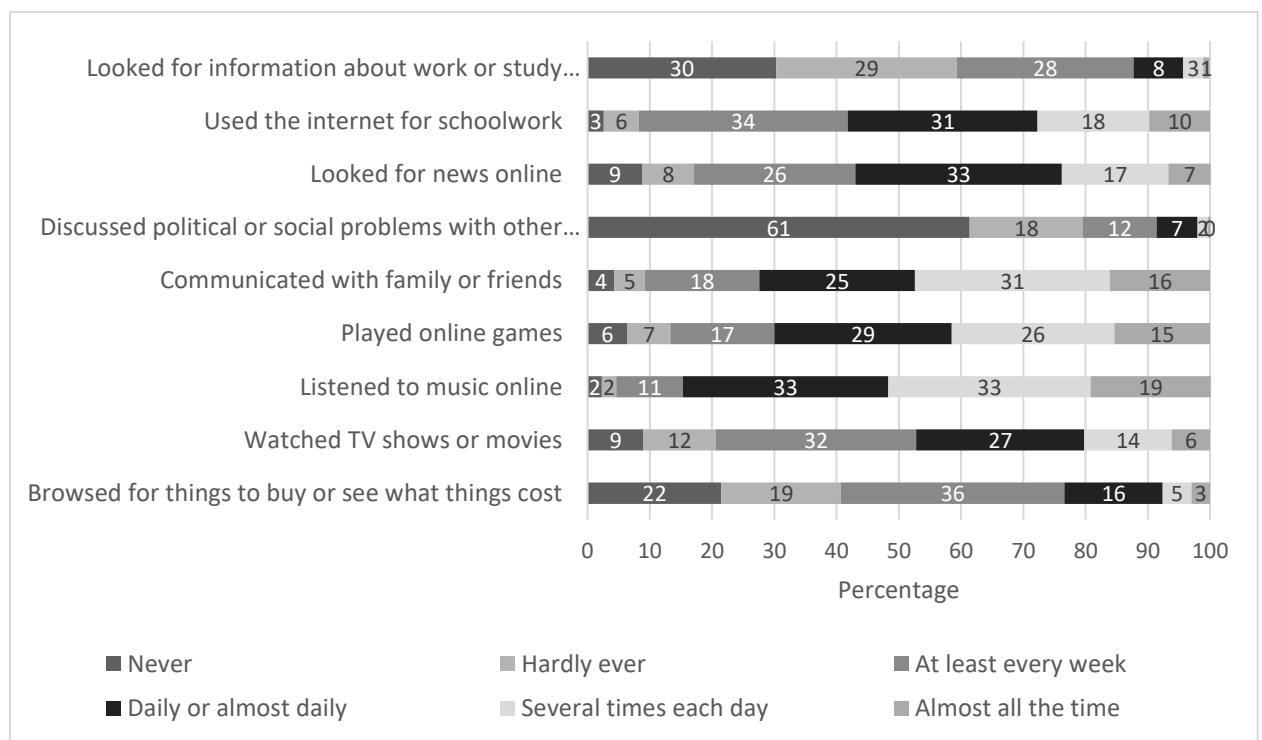


Fig. 1. Frequency (%) of online activities

IDENTITY FORMATION AND ONLINE ACTIVITIES IN ADOLESCENCE

Table 1

Descriptive statistics and correlations between study variables

Variable	<i>M (SD)</i>	EdCom	EdExp	EdRec	IntCom	IntExp	IntRec
<i>Identity processes</i>							
Educational commitment	3.63 (0.59)	1					
Educational in-depth exploration	3.34 (0.65)	0.57***	1				
Educational reconsideration of commitment	2.66 (0.89)	0.14**	0.38***	1			
Interpersonal commitment	3.60 (0.65)	0.39***	0.27***	0.38***	1		
Interpersonal in-depth exploration	3.32 (0.70)	0.31***	0.39***	0.27***	0.03	1	
Interpersonal reconsideration of commitment	2.12 (0.95)	0.06	0.15**	0.39***	0.20***	0.54***	1
<i>Online activities, skills, and risks</i>							
Looked for information about work or study opportunities	2.28 (1.31)	0.10*	0.21**	0.18***	0.10*	0.05	-0.06
Used the internet for schoolwork	3.85 (1.16)	0.12**	0.20***	-0.00	0.08	0.16***	-0.08
Looked for news online	3.62 (1.3)	0.17***	0.09*	-0.03	0.12**	0.10*	-0.08
Discussed political problems with other people online	1.70 (1.06)	0.07	0.14**	0.18**	0.07	0.09*	-0.03
Communicated with family or friends	4.23 (1.3)	0.10*	0.06	-0.10*	0.12**	0.06	0.02
Played online games	4.07 (1.38)	-0.05	-0.07	0.05	-0.10*	-0.01	0.07
Listened to music online	4.49 (1.12)	-0.02	0.01	0.00	0.03	0.03	-0.14**
Watched TV shows or movies	3.44 (1.29)	0.05	-0.01	-0.05	0.05	0.01	-0.15**
Browsed for things to buy or see what things cost	2.72 (1.26)	-0.05	0.02	0.06	0.04	0.02	-0.15**
Internet skills	4.60 (0.54)	0.19***	0.10*	-0.01	0.05	0.12**	0.07
Exposure to harmful content	1.46 (0.50)	-0.12**	-0.12**	-0.08	-0.02	-0.04	-0.21***
Excessive internet use	1.60 (0.56)	-0.14**	-0.16**	-0.06	-0.09*	0.02	-0.10*

Note. EdCom - Educational commitment, EdExp - Educational in-depth exploration, EdRec - Educational reconsideration of commitment, IntCom - Interpersonal commitment, IntExp - Interpersonal in-depth exploration, IntRec - Interpersonal reconsideration of commitment. M = Mean; SD = Standard deviation.

*** $p < .001$; ** $p < .01$; * $p < .05$.

IDENTITY FORMATION AND ONLINE ACTIVITIES IN ADOLESCENCE

Descriptive statistics (means, standard deviations) and correlations between study variables are presented in Table 1. Commitment and in-depth exploration in the educational domain were positively related to online activities such as looking for information about work or study opportunities, using the internet for schoolwork, and reading and watching the news online. In addition, positive correlations were obtained between educational commitment and communication with family and friends, and between educational in-depth exploration and discussing political or social problems with other people online. Commitment and in-depth exploration in the educational domain were also positively related to internet skills and negatively to exposure to harmful content and excessive internet use. Reconsideration of commitment in the educational domain was positively related with online activities such as looking for information about work or study opportunities, discussing political or social problems with other people online and negatively to communication with family and friends. Commitment in the interpersonal domain was positively related to online activities such as looking for information about work or study opportunities, looking for the news online, communicating with family and friends and negatively related to playing online games and excessive internet use. In-depth exploration in the interpersonal domain was positively associated with using the internet for schoolwork, looking for the news online, discussing political or social problems with other people online, and internet skills. Reconsideration of commitment in the interpersonal domain was negatively associated with online activities such as listening to music, watching TV, and browsing for things to buy. This process was also negatively related to exposure to harmful content and excessive internet use.

Cluster analysis. The results of cluster analyses indicated that the five-cluster solution was the most acceptable for our data on identity processes across educational and interpersonal domains. Multivariate Analyses of Variance (MANOVA) with Tukey post hoc tests on the z -scores of each identity process for the educational and interpersonal domains revealed that the five-cluster solution accounted for 47% of the variance in commitment for each domain (educational and interpersonal), 52% and 43% of the variance in in-depth exploration, and 49% and 44% of the

IDENTITY FORMATION AND ONLINE ACTIVITIES IN ADOLESCENCE

variance in reconsideration of commitment, in the educational and interpersonal domains, respectively. The retained five-cluster solution replicated the solution found in studies where identity processes were measured both at a global level (e.g., Crocetti, Schwartz, Fermani, Klimstra, & Meeus 2012) and in educational and interpersonal domains separately (Campbell, Zimmer-Gembeck, & Duffy, 2019).

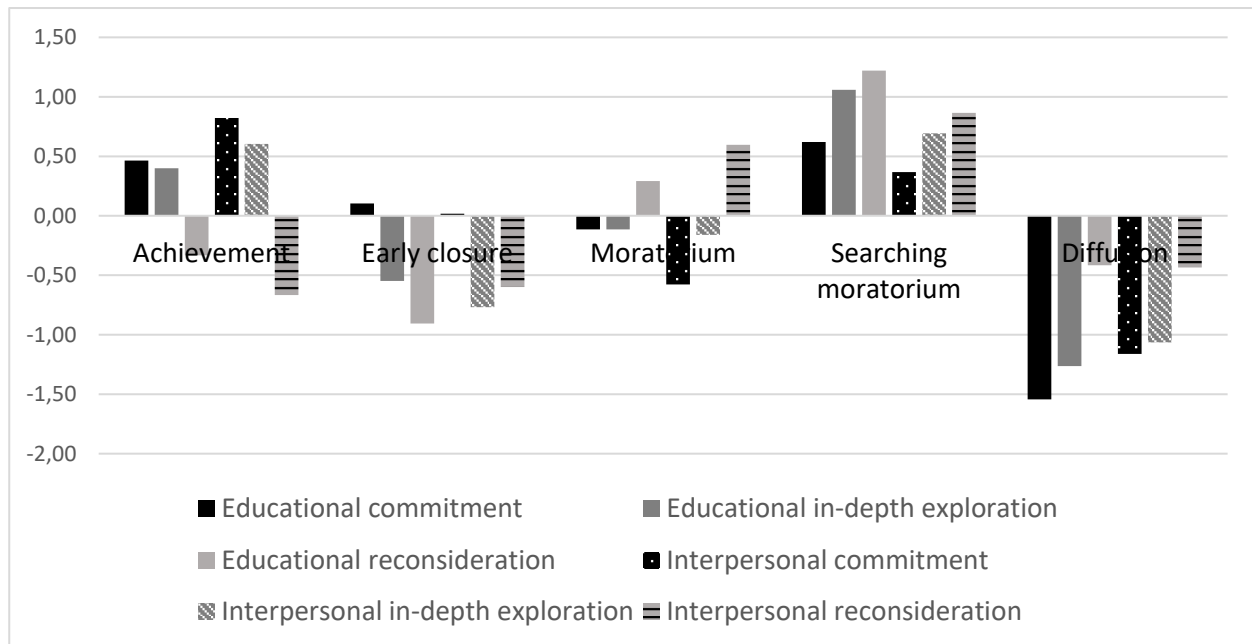


Fig. 2. Z-scores for commitment, in-depth exploration, and reconsideration of commitment by domain in the final five-cluster solution

The selected cluster solution is graphically represented in Figure 2. The five identity statuses were achievement ($N = 143$, 26.7%, above-average scores on commitment and in-depth exploration, but below average on reconsideration of commitment in both domains); early closure ($N = 95$, 17.7%, average scores on commitment and below average on in-depth exploration and reconsideration of commitment in both domains); moratorium ($N = 148$, 27.6%, average scores on commitment in the educational domain and below average on commitment in the interpersonal domain, but average on in-depth exploration and above average on reconsideration in both domains); searching moratorium ($N = 98$, 18.3%, markedly-high scores for in-depth exploration

IDENTITY FORMATION AND ONLINE ACTIVITIES IN ADOLESCENCE

and reconsideration and above average on commitment in both domains); and diffusion ($N = 52$, 9.7%, markedly-below average scores on commitment and in-depth exploration with below average on reconsideration in both domains).

3.2. *Multivariate Analyses of Variance*

Findings of the Multivariate Analyses of Variance (MANOVA) revealed a main effect of identity status on online activities (Wilks' $\lambda = 0.79$, $F(36, 1879.22) = 3.34$, $p < .001$, $\eta^2 = 0.06$). More specifically, the univariate effects were significant for all indicators of online activities, except for playing online games (see Table 2). Tukey post hoc comparisons highlighted that adolescents in the searching moratorium status were more active in looking for information about work or study opportunities than their peers in the early closure, moratorium, and diffusion statuses (with those in the achievement status reporting intermediate scores). Adolescents in the searching moratorium and achievement statuses were those using the internet for schoolwork more frequently than their peers in the moratorium and diffusion statuses (with those in the early closure status reporting intermediate score). Adolescents in the achievement status were significantly more active than adolescents in moratorium and diffusion in reading and watching the news online (with those in the early closure and searching moratorium statuses reporting intermediate scores). Adolescents in the searching moratorium status discussed political or social problems with other people online significantly more often than adolescents in the early closure and diffusion statuses (with those in achievement and moratorium reporting intermediate scores). Adolescents in the achievement status communicated more often with family and friends online than adolescents in the diffusion status (those in early closure, searching moratorium, and moratorium reported intermediate scores). The univariate effects were significant for some online entertainment activities such as listening to music and watching TV shows or movies, but the Tukey post hoc test revealed that adolescents in the five identity statuses did not differ significantly from each other. Finally, adolescents in the achievement and diffusion statuses used the internet for

IDENTITY FORMATION AND ONLINE ACTIVITIES IN ADOLESCENCE

purchasing-related activities significantly more often than adolescents in the early closure status (those in moratorium and searching moratorium reported intermediate scores).

There was also a main effect of identity statuses on internet skills and risks (Wilks' $\lambda = 0.89$, $F(12, 1399.89) = 5.32$, $p < .001$, $\eta^2 = 0.04$). More specifically, the univariate effects were significant for internet skills and both indicators of online risks (see Table 2). The results showed that adolescents in the diffusion status reported significantly lower online skills than adolescents in the other identity statuses. Adolescents in the early closure, moratorium, diffusion, and achievement statuses indicated higher exposure to harmful online content than adolescents in the searching moratorium status. Additionally, adolescents in the moratorium and diffusion statuses reported significantly higher excessive internet use than adolescents in the searching moratorium status (those in the early closure and achievement statuses had intermediate scores).

IDENTITY FORMATION AND ONLINE ACTIVITIES IN ADOLESCENCE

Table 2

Means and standard deviations of online activities, skills and risks according to the identity statuses

Variable	Identity statuses					F-value	η^2
	Achievement <i>M</i> (SD)	Early closure <i>M</i> (SD)	Moratorium <i>M</i> (SD)	Searching moratorium <i>M</i> (SD)	Diffusion <i>M</i> (SD)		
Looked for information about work or study opportunities	2.38 ^{ab} (1.17)	2.01 ^b (1.07)	2.11 ^b (1.03)	2.70 ^a (1.22)	2.10 ^b (1.02)	6.14 ^{***}	.05
Used the internet for schoolwork	4.04 ^{ab} (1.22)	3.73 ^{abc} (1.03)	3.60 ^{bc} (1.10)	4.10 ^a (1.11)	3.54 ^c (1.27)	4.92 ^{**}	.04
Looked for news online	3.87 ^a (1.26)	3.74 ^{ab} (1.22)	3.31 ^b (1.39)	3.69 ^{ab} (1.20)	3.27 ^b (1.27)	4.55 ^{**}	.04
Discussed political or social problems with other people online	1.74 ^{ab} (0.97)	1.42 ^b (0.83)	1.69 ^{ab} (1.09)	2.05 ^a (1.23)	1.46 ^b (0.80)	5.34 ^{***}	.04
Communicated with family or friends	4.45 ^a (1.13)	4.24 ^a (1.30)	4.19 ^{ab} (1.33)	4.22 ^{ab} (1.23)	3.71 ^b (1.54)	3.03 [*]	.02
Played online games	3.90 ^a (1.47)	4.01 ^a (1.40)	4.23 ^a (1.80)	4.27 ^a (1.14)	4.13 ^a (1.77)	1.56	.01
Listened to music online	4.70 ^a (1.01)	4.38 ^a (1.20)	4.28 ^a (1.22)	4.48 ^a (0.93)	4.69 ^a (1.22)	3.05 [*]	.02
Watched TV shows or movies	3.68 ^a (1.25)	3.43 ^a (1.17)	3.25 ^a (1.35)	3.26 ^a (1.27)	3.63 ^a (1.41)	2.73 [*]	.02
Browsed for things to buy or see what things cost	2.92 ^a (1.11)	2.37 ^b (1.17)	2.57 ^{ab} (1.36)	2.75 ^{ab} (1.29)	3.00 ^a (1.24)	3.87 ^{**}	.03
Internet skills	4.62 ^a (0.47)	4.64 ^a (0.37)	4.63 ^a (0.53)	4.67 ^a (0.49)	4.26 ^b (0.91)	6.06 ^{***}	.04
Exposure to harmful content	1.55 ^a (0.55)	1.51 ^a (0.50)	1.45 ^a (0.49)	1.25 ^b (0.40)	1.55 ^a (0.46)	6.55 ^{***}	.05
Excessive internet use	1.58 ^{ab} (0.52)	1.56 ^{ab} (0.53)	1.66 ^a (0.58)	1.43 ^b (0.38)	1.76 ^a (0.56)	3.80 ^{**}	.03

Note. $N = 536$. $M =$ Mean; $SD =$ Standard deviation; $\eta^2 =$ Eta-squared. The cluster means are significantly different at Tukey test ($p < .05$) if they have

different superscripts. *** $p < .001$; ** $p < .01$; * $p < .05$.

4. Discussion

The internet is becoming an inseparable part of adolescents' life. Previous studies have shown that adolescent online activities are intertwined with such aspects of their identity formation as self-exploration, self-presentation, or identity-related motives (Davis, 2013; Dunne et al., 2010; Manzi et al., 2018; Valkenburg et al., 2005). This study adds to the literature by providing novel insights into the nuanced pattern of associations between various forms of online activities, internet skills and risks, and identity formation. By taking a person-centered approach, we found that adolescents in different identity statuses (achievement, early closure, moratorium, searching moratorium, and diffusion) reported significant differences both in the extent to which they performed various online activities and also in their internet skills and risks.

4.1. Differences in online activities, skills, and risks among adolescents in different identity statuses

Drawing from an identity status perspective of identity formation (e.g., Meeus, 2018), five subgroups of adolescents with different identity statuses (achievement, early closure, moratorium, searching moratorium, and diffusion), based on their commitment, in-depth exploration, and reconsideration in two core identity domains (educational and interpersonal identity; Albarello et al., 2018) were identified. These five statuses, as based on two identity domains examined concurrently, (Campbell et al., 2019) replicate those identified in previous studies conducted in various cultural contexts (e.g., Crocetti et al., 2012; Morsünbül, Crocetti, Çok, & Meeus, 2016; Hatano, Sugimura, & Crocetti, 2016), across ethnic minority and majority groups (e.g., Crocetti, Fermani, Pojaghi, & Meeus, 2011), in youth with problem behaviors (e.g., juvenile delinquents and clinically referred youth; Klimstra, Crocetti, Hale, Kolman, Fortanier, & Meeus, 2011). Importantly, in this study, these different subgroups of adolescents showed different activities, skills, and risks in the digital context.

IDENTITY FORMATION AND ONLINE ACTIVITIES IN ADOLESCENCE

First of all, it is worth noting that adolescents in the five identity statuses differed in the extent to which they engaged in some online activities but not in others. More specifically, adolescents in the five identity statuses reported significant differences in the extent to which they looked for information about work or study opportunities and used the internet for schoolwork, they read and watched the news and discussed social issues, communicated with significant others (i.e., family or friends), and shopped online. In contrast, no differences were found in playing online games, listening to music, watching TV or movies, that is, activities frequently referred to as entertainment-oriented (Erhardt & Freitag, 2021). In this case, all adolescents reported comparably high levels of such activities.

As expected, adolescents in the searching moratorium and achievement statuses search for school and news-related information, discuss social issues, and communicate with significant others to a greater extent than their peers. These activities are in addition to being engaged in entertainment-oriented activities like their peers in the other identity statuses. Thus, the digital lives of adolescents in the searching moratorium and achievement statuses can be characterized by their richness of experiences, which has the potential to help develop adolescents' sense of self (Kruskopf, Hakkarainen, Li, & Lonka, 2021). At the same time, the internet skills of these adolescents are similar to those of their peers except for those in the diffusion identity status. In addition, those in the searching moratorium status also show low risks related to internet use.

The adolescents in searching moratorium and achievement have an active approach to their identity in common, as indicated by the high levels of commitment and in-depth exploration in both groups (Crocetti, Sica, Schwartz, Serafini, & Meeus, 2013). This study adds to prior literature by showing that these adolescents are active online in many ways while also managing to avoid risks related to internet use. Specifically, adolescents in the searching moratorium status have already engaged in identity exploration with the aim of understanding what is important for them, what their values, preferences, and goals are, and have already arrived at some personally meaningful identity commitments. Thus, they may already have a pretty clear understanding of

IDENTITY FORMATION AND ONLINE ACTIVITIES IN ADOLESCENCE

what they want to do when they are online and what they are not particularly interested in. Therefore, their activities online, while very diverse and intensive, are at the same time controlled by their inner compass (goals, values, preferences) and a sense of a clear direction (what they want to accomplish online). This internal structure can provide adolescents with a stronger capacity to resist the situational cues and temptations online (such as advertisements, casual conversations, idle browsing, etc.), which can lead to excessive internet use (Chung et al., 2019).

Adolescents in the searching moratorium status are also currently revising their identity, as indicated by their high levels of reconsideration of commitment, compared to the low levels reported by adolescents in the more stable achievement status (Crocetti, 2018). This study adds to prior literature showing that when an identity search occurs in a "safe" context, as the one occurring when meaningful existing commitments are being reconsidered, it is less stressful and harmful than when such search originates from a marked dissatisfaction with current commitments (as in the moratorium status; Crocetti, Rubini, Luyckx, & Meeus, 2008; Crocetti et al., 2012). In fact, in the digital context, adolescents in the searching moratorium and moratorium statuses differ not only in their diversity and richness of online activities (higher in the searching moratorium statuses) but also in their exposure to online risks (with higher exposure to harmful contents and excessive internet use found in the moratorium status). Thus, this study points out that, also in the digital realm, the searching moratorium and the moratorium statuses refer to the bright and dark sides of moratorium, respectively, as also documented in prior research linking them to personality factors, indicators of mental health, and well-being (see Crocetti, 2018 for a review).

Adolescents in the diffusion status are as active as others in most entertainment activities online but show low levels of looking for information on work and studies, using the internet for schoolwork, reading or watching the news online, discussing social issues online, and communicating. This pattern of internet activities may reflect the situational pleasure that adolescents in the diffused status seek, which can be linked to their tendency for identity procrastination (Crocetti et al., 2013). In line with our hypothesis, adolescents in the diffusion

IDENTITY FORMATION AND ONLINE ACTIVITIES IN ADOLESCENCE

status also reported the lowest levels of internet skills. On the one hand, the activities that adolescents in diffusion status undertake online may not be stimulating enough to develop their internet skills; on the other hand, their skills may be insufficient to engage in more complex and more stimulating online activities. Low skills may indicate their vulnerability in relation to online risks. The fact that they also scored high on purchasing-related activity indicates that they might be at risk for being easily influenced by marketing campaigns.

Adolescents in the fifth identity status, early closure, reported a mixed profile of online activities, skills, and risks. On the one hand, adolescents in early closure reported a less heterogeneous range of online activities (specifically, less search for information on work and studies and discussions on political issues online) when compared to their peers in the searching moratorium status. They are also less inclined to shop online compared to those in achievement and diffusion statuses. On the other hand, those in early closure reported similar levels of internet skills and online risks compared to most other statuses. Thus, even though adolescents in the early closure status were not active explorers of the online environment, they reported a relatively healthy relationship with it. This picture is consistent with identity research showing that adolescents in the early closure status are less proactive than their peers in the achievement status in terms of processing self-relevant information (Berzonsky, 2011; Crocetti et al., 2013), but they do report comparable levels of adjustment and well-being (Meeus, 2011).

4.2. Limitations and suggestions for future research

The results of this study should be considered keeping in mind a few important limitations. The first one is the cross-sectional nature of the study, which prevents further delving into the directions of effects. How do specific online activities, skills, and risks affect adolescent identity formation and vice-versa? Future longitudinal studies are necessary to answer these questions (Sebre & Miltuze, 2021). Second, the findings of the present study are based on self-reports. Future studies are needed to test whether the current evidence is replicated using objective measures of

IDENTITY FORMATION AND ONLINE ACTIVITIES IN ADOLESCENCE

internet use (Bricolo, Gentile, Smelser, & Serpelloni, 2007) and internet skills. In addition, the effect sizes in our study are small; thus, replications could help to clarify the actual strength of the links in focus. Furthermore, even though our data come from a larger international survey "EU Kids Online", our sample consisted only of Lithuanian adolescents as identity processes were evaluated only in Lithuania. Our findings may not apply to different cultural contexts since Lithuanian adolescents are characterized as particularly active internet users (Smahel et al., 2020). Future studies could investigate the links between online activities and identity statuses in other cultural contexts, characterized by different online activity levels among adolescents. Finally, the method we used for identifying subgroups of adolescents with different identity formation situations did not rely on a probabilistic approach; therefore, future studies should explore whether our results would be replicated using, for example, a latent variable framework.

5. Conclusions

In the context of a sharply growing amount of time spent online, it is crucial to understand how online activities are related to the ways in which adolescents face their most important developmental task that is forming their identity (e.g., Crocetti, 2018; Meeus, 2018). As emphasized in the literature, the online activities of children and youth should be viewed from the perspective of opportunities and risks (Livingstone, 2010). This study examined, in a nationally representative sample of Lithuanian adolescents, how participants classified into distinct identity statuses (achievement, early closure, moratorium, searching moratorium, and diffusion) across two identity domains central to the adolescent experience (educational and interpersonal identity; Campbell et al., 2019) differ in their patterns of online activities, internet skills, and risks. The findings highlighted that adolescents in the achievement and searching moratorium statuses can be characterized by a richness of online experiences. Adolescents in the searching moratorium status also report the lowest level of online risks. In contrast, those in the moratorium and diffusion statuses showed lower diversity and richness of online activities in combination with low internet

IDENTITY FORMATION AND ONLINE ACTIVITIES IN ADOLESCENCE

skills for those in the diffusion status. Adolescents in early closure showed a mixed profile of online activities. This evidence suggests that it is specifically the process of identity commitment that works as a compass for guiding youth online and optimizing their activities in the digital context. Overall, this evidence contributes to the identity literature, highlighting that adolescents in distinct identity statuses have specific patterns of interactions not only with proximal offline contexts (such as with their family and peers) but also in the digital arena.

Data availability statement: The data that support the findings of this study are available from the corresponding author upon reasonable request.

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