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Inequality in mobilizing online help after a negative life event: the role of education, digital skills, and capital-enhancing Internet use

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ABSTRACT

Many studies have investigated inequalities in coping with stressful life events and often education is found to play a role in this (the higher educated are usually more successful in dealing with their problems in terms of well-being consequences). We examine whether something similar occurs on the Internet, whether the higher educated are more successful in mobilizing help online, and whether this is related to their digital skills and the way in which they use the Internet. With the latter, we link online coping to digital inequality research. Researchers have investigated digital inequalities with regard to skills and types of Internet use. However, we know little about the extent to which these factors translate into inequalities in resources mobilized from the Internet. This latter type of inequality is highly relevant, since it is an intermediary step between Internet use and (improved) well-being and life chances. Using a large sample of individuals living in the Netherlands, we find educational differences in the mobilization of online problem-focused coping resources, but no differences with regard to online socioemotional or disengagement coping resources. The educational inequalities in online coping are somewhat smaller than educational inequalities in offline coping, leading to remarkable consequences for social policy. Furthermore, we find a relatively complex pattern of interrelations between offline inequality (education) and different types of digital inequality (skills, usage, resources). In our conclusions we make a plea for more research on outcomes of Internet use and we discuss the implications of our findings for further research.

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KEYWORDS

Digital divide; coping resource; digital skills; capital-enhancing Internet use; education

Introduction

In this paper we study the mobilization of coping resources by individuals who are confronted with stressful life events (Taylor & Stanton, 2007). These life events, which can seriously deteriorate quality of life, include the loss of a job, a serious health issue or...
psychological problem, and the loss or death of a partner or family member. The Internet provides access to coping resources that buffer against loss of well-being after negative life events (Barak, Boniel-Nissim, & Suler, 2008; Burrows, Nettleton, Pleace, Loader, & Muncer, 2000; van Ingen, Utz, & Toepoel, 2015; van Ingen & Wright, 2016). For instance, one can try to find information online about a therapy or treatment, or communicate with others who went through similar experiences.

Individuals differ in the extent to which they use the possibilities of the Internet for coping and in this paper we are particularly interested in whether educational qualifications play a role in this. Education is a well-known predictor of (successful) offline coping, which is one of the mechanisms underlying the SES gradient in health: when higher educated individuals are confronted with a stressful life event they are generally more successful in coping with this issue (compared to lower educated individuals). As a result, their well-being is harmed less by the event. In the theory section we argue that it is likely that something similar occurs on the Internet: we predict that the higher educated also mobilize more coping resources online when confronted with a negative life event. Furthermore, we argue that this may have to do with their digital skills and the way in which they use the Internet.

Many studies of digital inequality have looked at differences in digital skills and ‘advantageous’ types of Internet use, which have the potential to increase users’ social, human, and financial capital (Hargittai & Hinnant, 2008). Studies have shown that highly educated users tend to have stronger digital skills (van Deursen & van Dijk, 2011, 2015) and tend to engage in capital-enhancing forms of Internet use more often in comparison to their lower educated counterparts (Hargittai & Hinnant, 2008; Zillien & Hargittai, 2009). Often authors regard such findings as supportive of the claim that in modern Western societies the Internet contributes to the reproduction of traditional social inequalities (based on education, income, and occupational status), or even worse, that the Internet contributes to growing inequalities (see Robinson et al., 2015, for an overview). However, our knowledge about the conversion of traditional social inequalities into digital inequalities is incomplete. There is a need for more research on the potential inequality in benefits derived from Internet use (van Deursen, van Dijk, & Helsper, 2014). Differences in skills and types of Internet use imply that individuals will differ in what they get out of their Internet use. Few studies have actually tested this, with the exception of a few studies that looked at learning achievements of pupils as beneficial outcomes of digital skills or ICT use (Pagani, Argentin, Gui, & Stanca, 2016; Thiessen & Dianne Looker, 2007). In general population studies DiMaggio and Bonikowski (2008) looked at effects of Internet use on earnings and Matzat and van Ingen (2016) examined effects on initiating career-relevant social contacts online.

We contribute to the literature in the following ways. First, we replicate existing studies of education, digital skills, and types of Internet use with a large, representative dataset from the Netherlands. Second, we analyze whether these factors lead to differences in the online mobilization of problem-focused, socioemotional, and disengagement resources (see below). In other words, we study the interrelations between three types of digital inequality (skills, type of applications used, and mobilization of coping resources). Third, we assess whether educational inequalities in the mobilization of online resources are larger or smaller than inequalities in the mobilization of offline resources. By
doing so, we can answer the question of whether the Internet increases or decreases inequalities in this domain.

**Theoretical background and hypotheses**

There is a large literature that suggests that socioeconomic status and (mental) health are related (Ross & Wu, 1995). For example, studies have shown a social gradient in many health behaviors and problems (Borg & Kristensen, 2000; Pampel, Krueger, & Denney, 2010). These studies usually find that the higher educated and those from higher social classes are healthier and better off in terms of subjective well-being.

One reason for these inequalities is that individuals deal with their problems in different ways. For instance, the harms of negative life events can be reduced by choosing the right coping strategy and by mobilizing social support (Folkman & Moskowitz, 2004; Taylor & Stanton, 2007) and there is considerable evidence that suggests that those in more privileged socioeconomic positions find more fruitful ways to deal with their problems in comparison to their less privileged counterparts (Ross & Wu, 1995). This makes those in better socioeconomic position less vulnerable to the negative effects of stressors and life events like divorce, widowhood, or involuntary job loss (McLeod & Kessler, 1990).

The Internet offers several ways of coping with negative life events (see below), and the determinants of online coping are different from those of offline coping (van Ingen & Wright, 2016). This begs the question of whether individuals in better SES positions – or in our case: the higher educated – are also better off with regard to the mobilization of online help, and why. Below, we focus on two possible factors that suggest that the higher educated should be better off: digital skills and capital-enhancing Internet use.

**The conversion of educational inequality into inequality in digital skills**

Our first two hypotheses replicate previous research. This is relevant since most of the data these studies used were collected before social network sites (SNSs) and mobile communication technologies became widely spread. Thereafter, we provide a short summary of research on coping strategies individuals apply when handling stressful life events and we develop four additional hypotheses about effects of Internet use on the mobilization of online coping resources. Together, these six hypotheses predict how education, digital skills, Internet use, and the mobilization of online coping resources are interrelated.

In the 1990s Western policy makers were concerned about the lack of access to the Internet that some social groups faced. These worries were supported by early digital divide studies, in which several groups were found to lack access to the Internet, such as older people, lower educated individuals, citizens in rural areas, and, at least in some earlier studies, women (e.g., Campbell, Dries, & Gilligan, 1999). After the year 2000, it became clear that issues of inequality are not confined to the question of access to the Internet. Researchers realized that another important type of digital inequality was emerging: differences in digital skills (van Deursen & van Dijk, 2011; van Ingen, De Haan, & Duimel, 2007).

The findings of several of these studies have fueled the concern that deprived groups have weaker digital skills (Helsper & Eynon, 2013; Robinson et al., 2015). For instance, van Deursen and van Dijk (2011) found that Dutch Internet users with a higher education
had stronger digital skills than lower educated Internet users. Similar results were found in several other countries (e.g., Correa, 2016; Helper & Eynon, 2013). Although these studies leave open the question of whether better educated individuals acquire stronger digital skills through ‘better’ guided training in school (Meneses & Momino, 2010), more learning by trial-and-error (Matzat & Sadowski, 2012), or a combination thereof, they document a clear advantage for the better educated. This leads to our first hypothesis:

**H1** Educational level is associated with better digital skills.

The relation between digital skills and internet usage

Studies have found that users with better skills were more likely to conduct specific ‘capital-enhancing’ forms of Internet use, or use applications that have the potential to increase users’ social, human, and financial capital. Some refer to these differences in types of Internet use as the ‘second digital divide’ (Haight, Quan-Haase, & Corbett, 2014). Hargittai and Hinnant (2008), in their study of young adult Internet users, analyzed the number of capital-enhancing websites utilized by their respondents. These included websites about health and financial information, national and international news, product information, and governmental services. They showed that higher educated users and users with better digital skills used more of these websites. Zillien and Hargittai (2009), in a study of German Internet users, demonstrated that users with better technical proficiency and Internet knowledge used the Internet more intensively for searching health information, product information, stock prices, political news, and more. Helser and Eynon (2013) demonstrated that British Internet users with better digital skills (in the form of higher digital self-efficacy) were more likely to show ‘critical engagement’ (looking for online health information, news, travel information, school/work information, topics of personal interest), social engagement (using different types of social media), and creative engagement on the Internet, such as gaming, up- and downloading of videos and music. With ‘gaming’ we refer to single and multiplayer games played on the Internet.

One counter example is a study of young adults in Chile by Correa (2016), in which she finds no relation between digital skills and Facebook use. This may be because of the limited age range in her sample, reducing the variation in digital skills. Since we have more variation in age and thus skills, and given the wealth of evidence supporting the link between digital skills and capital-enhancing Internet use, we predict that users with better skills are more likely to recognize the added value of online activities and more likely to regard online applications as easy to use (Eastin & LaRose, 2000), leading to our second hypothesis (see Figure 1 for an overview of our hypotheses).

**H2** Better digital skills are associated with spending more time on a) searching for information b) using discussion fora, c) social networking services, and d) online gaming.

The relation between internet usage and mobilized online resources

We distinguish between three dimensions of coping, in line with previous work on both offline (Lyne & Roger, 2000) and online coping (van Ingen et al., 2015): problem-focused coping, socioemotional coping, and disengagement. **Problem-focused coping** involves a rational approach to handling a stressor and taking active measures that aim at removing
the stressor or reducing its adverse effects (Carver, Scheier, & Weintraub, 1989). *Socioemotional coping* consists of activities that are primarily aimed at dealing with the negative consequences of the stressor, which often involves interpersonal contact. Relevant others can be asked for advice, assistance, understanding, and comfort. Furthermore, they provide opportunities to share one’s problems and emotions. *Disengagement* is an avoidance-based form of handling a negative event (ibid.). Research indicates that (offline) disengagement can sometimes have undesirable effects. Some researchers regard it as a dysfunctional strategy (Carver et al., 1989), although the extent to which these three different coping strategies are effective in handling stressful life events depends on the type of problem and the individual’s life circumstances (Folkman & Moskowitz, 2004). The findings concerning the role of online disengagement in coping are mixed: some report negative effects of gaming on well-being (Kaczmarek & Drążkowski, 2014). On the other hand, gaming has also been reported to play a role in stress relief (Reinecke, 2009).

The Internet is often successfully used as a source of information by individuals who are confronted with health problems, psychological issues, or unemployment (e.g., Fieseler, Meckel, & Müller, 2014; Rice & Katz, 2001). Furthermore, Gundersen (2011), in an in-depth study of 10 parents whose children suffered from a rare genetic disorder, found that after the parents had found useful information online they became increasingly capable of comprehending and managing their situation (problem-focused coping). These parents reported that through searching for information they were better able to accept their situation and shift their expectations about the future. Therefore, our third hypothesis is as follows.

**H3** Time spent on searching for online information is associated with mobilizing more problem-focused coping resources.

Online communities and discussion forums are often used by individuals who are confronted with a critical life event, including people with diabetes, eating disorders, older adults with reduced mobility, and patients with serious diseases, such as cancer or HIV/AIDS (e.g.,
Mo & Coulson, 2013). Research has shown that these online support groups provide participants with a number of benefits, including social support (Coursaris & Liu, 2009; Shim, Cappella, & Han, 2011). Furthermore, participation in online health and support groups is known to contribute to users’ personal empowerment, or the ability to act effectively when aiming for a desired goal (Barak et al., 2008; van Uden-Kraan et al., 2008).

Members of online support groups can stay anonymous if they want (Barak et al., 2008), which encourages self-disclosure and expression of negative emotions (Shim et al., 2011). A substantial proportion of messages posted on online communities has been found to include emotional disclosure (Coursaris & Liu, 2009). In addition, research has shown that members of online support communities discuss the restrictions they face as a result of their situation (Braithwaite, Waldron, & Finn, 1999). Finally, Mo and Coulson (2013) found that participation in online support groups increased optimism. These findings suggest that online support groups facilitate the mobilization of socioemotional coping resources.

This led to our fourth hypothesis:

H4 Time spent on forums and online communities is associated with (a) mobilizing more problem-focused coping resources and (b) mobilizing more socioemotional coping resources.

Online gaming has become popular for a variety of reasons. For example, game immersion and escapism are mentioned often among gamers as their main motivation (Hagström & Kaldo, 2014). In line with this, survey research has demonstrated that online gaming is a way of handling stressful events (Reinecke, 2009). Therefore our fifth hypothesis is as follows.

H5 Time spent on online gaming is associated with mobilizing more disengagement resources.

Recently, a study among students in the US indicated that several types of social support can be mobilized from Facebook (Johnson et al., 2013). Moreover, some Facebook users utilize the online network service actively to request for help and support (Ellison, Gray, Vitak, Lampe, & Fiore, 2013). These findings indicate that SNSs play a role in the mobilization of socioemotional coping resources.

Furthermore, there are several ways in which SNSs can be used for entertainment and other activities that facilitate mental disengagement. Park, Kee, and Valenzuela (2009) find that entertainment is one of the four main motivations for using Facebook. Similarly, Ku, Chu, and Tseng (2013) find that individuals reported amusement as a gratification of the usage of SNSs, which includes having fun, finding relaxation, and enjoying ‘the pleasure of contacting people’ (p. 230). Thus, our sixth and final hypothesis is:

H6 Time spent on social network sites is associated with (a) mobilization of more socioemotional coping resources and (b) mobilizing of more disengagement resources.

Research design, measurements, and methods of data analysis

Data

Our participants were drawn from a panel with a membership whose important demographic characteristics are in line with the characteristics of the population of
the Netherlands aged 16 years and older (Longitudinal Internet Studies for the Social Sciences – LISS). Refreshment samples are drawn to maintain the panel’s representativeness. Questionnaires are answered online. Participating households are equipped with a computer and Internet access when necessary. Monthly surveys are conducted lasting 15–30 minutes, and respondents are paid 15 euros per hour to complete the questionnaires. Our analyses are based on a sample of 3533 respondents.

In January 2014, a questionnaire about online coping was administered to the panel. The response rate was almost 83%. The coping items on the questionnaire were preceded by retrospective questions regarding five types of negative life events in the previous three years: (1) physical health problems, (2) mental health problems, (3) involuntary job loss, (4) being divorced or widowed, and (5) other events with a lasting impact on one’s daily activities. In auxiliary analyses we added length of recall period (months since start of the negative life events) to our main model (Figure 2). This variable had no effect on any of the coping dimensions. Therefore we did not include it in the final model.

Respondents who reported experiencing such an event were asked how they coped with it. Those who experienced multiple events were asked to consider the one with the largest impact on their daily activities. To assess potential differences between the group that registered an event (and hence answered the coping items) and the group that did not we performed a logistic regression with the selection variable as outcome (0 = no, 1 = yes). The only variable that tested significant was age, but its effect was very small (odds ratio = 1.007). Time spent using a computer (hours per week), income, education, gender, and partner status did not have an effect on participation in the questionnaire.

Respondents were also asked whether their partner or one of their children living at home had suffered from one of the life events mentioned. Respondents were explicitly instructed to think about what they did (not their partner or child) in response to the

**Figure 2.** SEM of education, digital skills, Internet usage, and dimensions of online coping (standardized coefficients). Note. N = 3533. Paths that were non-significant (p ≥ .05) are not shown. Age, gender, and education were included as determinant for all endogenous variables; type of event, and severity of event were included as controls for the three online coping factors. Standard errors are adjusted for clustering in households.
problem. Auxiliary analyses showed that results were virtually identical to those based on models with respondent events only.

**Variables**

The variable *education* represents the highest level of education respondents have reached, irrespective of whether they received a diploma. The variable has six levels: (1) primary school, (2) intermediate secondary education, (3) junior college, (4) senior high school, (5) college, and (6) university. Education was measured at the start of the recall period (January 2011). Missing values were substituted by the nearest non-missing value.

The *online coping* inventory we used in our analyses consisted of 14 items across 3 dimensions of coping: problem-focused coping (Cronbach’s α = .88), socioemotional coping (Cronbach’s α = .90), and disengagement (Cronbach’s α = .71) (see van Ingen et al., 2015 for more details). The inventory is based on the well-known brief COPE (Carver, 1997), from which we selected the dimensions that are relevant in the context of the Internet. For example, ‘I turned to the Internet to take my mind off things’ was one of the items that measured disengagement; ‘I consulted the Internet to come up with a strategy about what to do’ was an item that measures problem-focused coping; and ‘I got help and advice from other people through the Internet’ was an item that measured socioemotional coping. All of the items had four answer categories: (0) This doesn’t apply to me at all, (1) This applies to me a little bit, (2) This applies to me a medium amount, (3) This applies to me a lot. As typical for the well-known COPE (Carver, 1997), the items refer to a mixture of gained benefits (e.g., ‘help and advice’) and mobilized resources that are instrumental for gaining benefits. Participants received explicit instructions to think exclusively about how they used *the Internet* to deal with their problems. Table 1 shows the correlations between the most important variables in our study, as well as descriptive statistics.

We asked respondents about *offline coping* using a similar battery of coping items, with similar answer categories. In order to avoid confusion about whether online activities are also part of these (offline) coping strategies, the items were preceded by the following instructions: ‘The next questions do not concern online activities, but activities you performed besides them in order to deal with your problems’. The offline coping items, as well the Internet skills items (see below) were part of a split run in the questionnaire (random selection of 50% of the participants; n = 1772).

*Internet Skills* are measured by an often used six-item scale, created by Hargittai and Hsieh (2012) for measurement of Internet skills in a general population. Respondents were asked ‘How familiar are you with the following computer and Internet-related items?’ The items were: (1) Advanced search, (2) PDF, (3) Spyware, (4) Wiki, (5) Cache, and (6) Phishing. There were five answer categories, ranging from ‘No understanding’ to ‘Full understanding’. The scale score represents the average across the six items (Cronbach’s α = .91). A previous study – based on an older version of the scale – has shown that knowledge of these items predicts actual web-use skills (measured by observations in a laboratory) better than other proxy variables (Hargittai, 2005). The scale explained 32% of the variance in observed skills, whereas self-perceived skills explained 24%, years using the Internet 11%, and time spent online 5%.

The variables that register the *time spent on Internet activities* were merged from the ‘social integration’ module of the LISS, administered to the panel February 2012. Missing
### Table 1. Correlations and descriptive statistics.

<table>
<thead>
<tr>
<th></th>
<th>Education</th>
<th>Digital skills</th>
<th>Online gaming</th>
<th>Searching</th>
<th>Forums &amp; com.</th>
<th>SNSs</th>
<th>Disengagement</th>
<th>Problem-foc. cop.</th>
<th>Socioemo. cop.</th>
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<tr>
<td>Education</td>
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<td></td>
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<tr>
<td>Digital skills</td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Online gaming(^a)</td>
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<td>(.05)</td>
<td>1</td>
<td></td>
<td></td>
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<td>Searching(^a)</td>
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<td>.33</td>
<td>.12</td>
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<td>.11</td>
<td>.30</td>
<td>.13</td>
<td>.24</td>
<td>1</td>
<td></td>
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<tr>
<td>SNSs(^a)</td>
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<td>.25</td>
<td>.29</td>
<td>.25</td>
<td>.25</td>
<td>1</td>
<td></td>
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<tr>
<td>Disengagement(^b)</td>
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<td>.21</td>
<td>.14</td>
<td>.18</td>
<td>.21</td>
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<tr>
<td>Problem-foc. cop.(^b)</td>
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<td>.18</td>
<td>.04</td>
<td>.12</td>
<td>.17</td>
<td>.15</td>
<td>.45</td>
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<tr>
<td>Socioemo. cop.(^b)</td>
<td>(.01)</td>
<td>.05</td>
<td>.06</td>
<td>(.04)</td>
<td>.17</td>
<td>.16</td>
<td>.38</td>
<td>.63</td>
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<tr>
<td>Mean</td>
<td>3.71</td>
<td>2.89</td>
<td>0.32</td>
<td>1.16</td>
<td>0.13</td>
<td>0.56</td>
<td>1.47</td>
<td>1.27</td>
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<td>SD</td>
<td>1.49</td>
<td>1.36</td>
<td>0.66</td>
<td>0.74</td>
<td>0.37</td>
<td>0.80</td>
<td>0.69</td>
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</table>

**Note.** All correlations are significant at \(p < .05\) (two-tailed) except those in parentheses.

\(^a\)Log of time spent on online activity.

\(^b\)Average scores.
values were substituted by scores from the 2013 wave if possible. Since not all of our respondents answered these modules (or at least one), some values remained missing (see Table 1). Respondents were asked how many hours per week they spend on these activities on average. We focus on the time spent searching for information, online gaming, using SNSs, and participating in forums & online communities. The searching variable is a combination of two items: searching for information and searching for and comparing products/product information. We combined these items because both may be relevant in the coping process. The SNSs variable is also a combination of two items: SNSs and chat. The latter is included since chatting is almost exclusively done on SNSs nowadays.

A few respondents registered exceptionally high values (e.g., 168 hours per week). Since these outliers can affect the findings, we recoded the variables to have a maximum of 56 (7×8) hours per week on a specific Internet activity. We transformed these variables (by adding one and taking the log) to reduce the skewness of their distributions.

**Analytical strategy**

We use structural equation models to test our hypotheses. We employ maximum likelihood with missing values (MLMV; Stata 13) to deal with missing data, in order to ensure that as much information as possible is used in our analyses. This method is valuable here, since the items on digital skills and offline coping were administered to only half the sample (see Variables section). The missing-completely-at-random (MCAR) assumption was met by design in this case, since the respondents who received the split-run items were randomly selected. For the time-spent-on-Internet-activities variables, the MCAR assumption was not met by design. However, auxiliary analyses (available from the authors on request) showed that the results with and without imputation of these missing values are virtually identical.

Standard errors were corrected for clustering in households by applying Stata’s vce (cluster) option, which takes into account that observations within the clusters (households) are not independent of each other (See StataCorp, 2013, p. 309). We allow the error terms of the different latent online coping dimensions to be correlated.

**Results**

The participants in our survey are a diverse group, reflecting the probability sample that was drawn from the Dutch population. There was a slight overrepresentation of women (53.5%) and the age range was between 16 and 93 years old ($M = 51.1; SD = 17.3$). All educational groups were represented: 3% primary school, 23% intermediate secondary education, 24% junior college, 9% senior high school, 27% college, and 14% university. There was considerable variation in the popularity of types of Internet usage: 89% indicated to have used the Internet to search for information (and those who did spent 3.7 hours a week on average on this activity), 46% to use an SNS (3.9 hours a week), 28% to play online games (3.6 hours a week), and 17% to participate in online forums & communities (1.6 hours a week).

Figure 2 displays our results. Conventional measures of model fit are not valid for this model because of the cluster correction we applied (see methods). However, the same
model without clustering correction had good model fit: RMSEA .049; CFI .937; TLI .916. We find strong support for our first hypothesis. Replicating previous studies with a large sample, we find a positive and strong effect of education on digital skills.

Our second hypothesis predicted positive effects of digital skills on all types of Internet usage. Our data supported this idea; all four paths from digital skills to Internet usage were significant and positive.

The convergence of educational differences into inequality in digital skills, and subsequently the conversion of digital skills into usage differences imply that the higher educated should spend more time on all four types of Internet usage. However, our data show that the relations between education and Internet usage are more complex than that. On top of the indirect paths through skills there are other mechanisms that connect education to Internet usage, as suggested by the significant direct effects of education on usage we found.

In the case of online gaming and SNSs these direct effects (partly) compensate the positive indirect effects; in the case of searching the direct effect adds to the indirect effect. This is illustrated in Table 2. Because of the positive effect of education on digital skills and the positive effect of digital skills on (time spent on) gaming, there is a positive indirect effect of education on gaming ($\beta = .047$). However, the negative direct effect of education on gaming is bigger than the indirect effect, which means that the total effect is negative ($\beta = -.117$). Something similar can be seen in the case of SNSs: there are mechanisms that counterbalance the positive indirect effect through digital skills, although here the total effect is not significantly different from zero. In the case of searching, the direct effect further boosts the differences due to education, resulting in a total effect of $\beta = .182$.

The third stage of conversions of inequalities consists of the paths from Internet usage to the mobilization of online coping resources in Figure 2. In line with hypothesis 3, we found a significant and positive effect of searching for information on problem-focused coping. However, this effect was very small ($\beta = .05$).

Another determinant of problem-focused coping was time spent on forums ($\beta = .09, p < .05$). Furthermore, time spent on forums and online communities was also positively related to socioemotional coping. Both findings are in line with hypothesis 4. An effect we did not anticipate was the path from forums to disengagement. This positive effect implies that participants’ activities on forums are not necessarily all instrumental but can also involve recreational activities.

### Table 2. Total effects of education on Internet usage and indirect effect through digital skills (standardized effects and $Z$ scores).

<table>
<thead>
<tr>
<th>Path</th>
<th>Indirect effect through digital skills</th>
<th>Total effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educ $\rightarrow$ Gaming</td>
<td>.047 \ (4.84)**</td>
<td>$-.117 \ (6.32)**$</td>
</tr>
<tr>
<td>Educ $\rightarrow$ Searching</td>
<td>.098 \ (8.89)**</td>
<td>.182 \ (9.70)**</td>
</tr>
<tr>
<td>Educ $\rightarrow$ Forums</td>
<td>.092 \ (7.52)**</td>
<td>.053 \ (2.82)**</td>
</tr>
<tr>
<td>Educ $\rightarrow$ SNSs</td>
<td>.058 \ (6.08)**</td>
<td>$-.018 \ (-1.10)$</td>
</tr>
</tbody>
</table>

*p < .05.<br>**p < .01.
Our fifth hypothesis stated that time spent on online gaming should affect the extent to which Internet users mobilize disengagement resources from the Internet. The positive and significant path reported in Figure 2 supports this idea.

The effects of SNSs on mobilized coping resources were summarized in our sixth hypothesis. Supporting this hypothesis, two paths were found: one from SNSs to socioemotional coping and another one from SNSs to disengagement.

A final step in our analyses is to look at the total effects of education on the three dimensions of online coping. Although we did not formulate hypotheses explicitly, the reasoning about the conversions of different inequalities implies that the higher educated should mobilize more online coping resources, with regard to all three dimensions. This is analyzed in Table 3. Furthermore, we performed similar analyses on items of offline coping, thereby providing an indication of whether educational inequalities are greater online than offline.

According to Table 3, there is no relation between education and the mobilization of resources for disengagement. In other words, the lower and higher educated seem to do this to the same extent. Furthermore, there was no (significant) difference between online and offline in this regard. The case of problem-focused coping is different: the higher educated, when compared to the lower educated, mobilize more of these resources from the Internet, as well as from other, offline domains. The point estimate of the offline effect is somewhat larger than the estimate of the online effect, although there is considerable overlap in the confidence intervals around these estimates. In the case of socioemotional coping, we did not find a total effect of education on online resources, but we did find a positive total effect on offline resources. In other words, the higher educated mobilize more social support from their offline contacts (e.g., friends and family) than the lower educated, but this pattern is not reproduced on the Internet, the higher and lower educated mobilize online resources for the sake of socioemotional coping to the same extent. Overall, educational differences in the successful mobilization of coping resources are somewhat smaller for online mobilization than for offline mobilization. Furthermore, as Figure 2 indicates, there are no significant direct effects of education on any type of online coping after the mediating effects of skills and usage have been taken into account.

**Additional results: more efficient usage**

In additional analyses, we explored an alternative idea about how education affects the mobilization of online coping resources. Instead of reasoning that the higher educated

<table>
<thead>
<tr>
<th>Table 3. Total effects of education on mobilized online and offline coping resources (standardized effects and Z scores).</th>
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<tbody>
<tr>
<td><strong>Online</strong></td>
</tr>
<tr>
<td>Educ → Disengament</td>
</tr>
<tr>
<td>(1.08)</td>
</tr>
<tr>
<td>Educ → Problem-focused coping</td>
</tr>
<tr>
<td>(3.99)**</td>
</tr>
<tr>
<td>Educ → Socioemotional coping</td>
</tr>
<tr>
<td>(−1.39)</td>
</tr>
</tbody>
</table>

*p < .05.

**p < .01.
spend more time on certain types of Internet usage one might reason that their usage is more efficient. If they are better capable of drawing resources from their Internet usage than the lower educated this means that they should end up with more mobilized resources despite spending the same amount of time online. We tested this idea by adding twelve interaction terms to our model (education × four types of Internet usage, on three different coping dimensions). However, the results (not shown) were not very promising: neither one of these interaction terms was significant, thereby implying that the Internet usage of the higher educated is not more efficient than the Internet usage of the lower educated.

In a similar vein we tested whether digital skills made Internet usage more efficient (i.e., whether the effects of usage on resources were greater for those with good skills than for those with poor skills). The results were consistent as well: no support was found for this idea.

**Summary and discussion**

The aim of the current paper was to enhance our knowledge of inequality in online coping, the role of education in this, and the interconnections between three types of digital inequalities (skills, type of Internet use, and online coping resources). Especially the conversion of Internet use into inequality of coping resources is a crucial step in terms of the consequences of Internet use on individuals’ subjective well-being and health, and it enhances our understanding of how the rise of the Internet has changed the relation between socioeconomic status and coping.

We conclude that educational inequalities in the mobilization of coping resources on the Internet do exist. In this sense, educational inequalities are reproduced online. At the same time, educational inequalities in the mobilization of online coping resources are smaller than those in the mobilization of offline coping resources. Furthermore, the effects of education are to some extent mediated by differences in digital skills and differences in capital-enhancing forms of Internet use, but the interrelations are complex, as there are also direct effects of education on use that are not mediated by digital skills.

Surprisingly few studies have framed the digital divide in terms of profits or gains from Internet usage, with the exception of educational outcomes (Pagani et al., 2016; Thiessen & Dianne Looker, 2007) and labor market-relevant outcomes (DiMaggio & Bonikowski, 2008; Matzat & van Ingen, 2016). Several scholars have drawn conclusions about ‘capital-enhancing activities’ on the Internet (e.g., Hargittai & Hinnant, 2008), but these have been based on assumptions about the effects of certain types of usage rather than actual tests. In this paper we explored one particular domain in which the Internet can provide benefits for those who use it effectively: the mobilization of coping resources.

Educational differences convert most strongly into inequality in skills. The relations between education and Internet activities are weaker and ambiguous, and the differences in mobilized online resources due to education are modest. The latter are obviously related to how usage converts into mobilized resources: the differences between the higher and lower educated are small regarding time individuals spend on forums & online communities and non-existent regarding SNSs. Therefore, the differences in outcomes produced by these online activities are also small. The usage differences are greatest with regard to
searching for information, but this activity only has a small effect on the mobilization of
online resources.

Our findings suggest that the (weak) relation between education and usage is a promi-
nent reason why educational differences do not convert into large differences in mobilized
coping resources from the Internet. One of the reasons for this might be that during its
history, the Internet has become more and more user friendly. Nowadays, little knowledge
(if any) of the techniques behind the Internet is needed in order to be able to use applica-
tions like SNSs or online support groups successfully. This would also explain the
lack of interaction effects between usage and education (or skills for that matter) on mobi-
lized resources. Thus, we conclude that it requires relatively few skills to mobilize coping
resources from the Internet.

Nonetheless, there is some reproduction of educational inequality in the amount of
mobilized online resources for the sake of problem-focused coping. This is relevant,
because this coping strategy is generally considered to be the most effective way of coping.
However, also in this case, the inequality online was not larger than it was offline (as
suggested by the effects of education on online versus offline problem-focused coping).

Some of our findings were unanticipated. Interestingly, we found an effect of time spent
on forums & online communities on disengagement. There are few previous studies that
have reported this. An exception is research by van Uden-Kraan et al. (2008), who
reported that participants in online support groups for breast cancer, arthritis, and fibro-
myalgia also indicated participating for the sake of relaxation, catching up with others, and
amusement. Another result, which was somewhat unanticipated were the direct effects of
education on usage, which sometimes counterbalance the positive indirect effects through
skills. This was especially true in the case of SNSs, where the direct and indirect effect can-
celled each other out. Future research should examine what other mechanisms explain
how educational inequality converts into inequality in Internet use.

A few limitations of our research deserve to be discussed. First, online coping resources
are only one set of outcomes of Internet usage. Other kinds of outcomes may well be stron-
ger related to education. For instance, DiMaggio and Bonikowski (2008) examine the
effects of Internet use on earnings. Searching the Internet for information is a type of
usage that likely plays an important role here, and this is the type of online activity we
found to be related to education most strongly.

Second, our data stem from retrospective questions in a survey, going back three years.
And as we know, the human memory is not perfect. In other words, it is unlikely that
respondents were able to reconstruct what happened and how they coped with the situa-
tion perfectly. On the other hand, these questions are about major life events, which
should be among the easiest things to remember. The lack of effects of length of recall
period in our model (see data) also implies that it is unlikely that this is a major threat
to the validity of our conclusions.

Third, and related to the previous point, a shortcoming of our research design is the fact
that not all variables were measured at exactly the same point in time. We asked respon-
dents (retrospectively) about negative life events and online/offline coping during the
period January 2011 to January 2014. We did not ask retrospective questions about digital
skills because it seemed unlikely that respondents would be able to recall this correctly.
This means that one assumption of our models is that the inter-individual differences
in skills are to a large extent stable across the period of research (intra-individual change is not necessarily problematic if inter-individual differences remain the same).

Fourth, our measure of digital skills was not the most refined measure available. There may be other measures that explain the interrelationship between education and mobilization of resources better. For instance, strategic digital skills measure to what extent users can realize their personal goals via the Internet (van Deursen & van Dijk, 2011). These may mediate the relationship between education and the mobilization of online coping resources.

Fifth, the adjusted version of the well-known COPE inventory (Carver, 1997) consists of a mixture of gained benefits (outcomes) and mobilized resources which are instrumental for gaining benefits but do not directly tap into the concept of outcomes. In this sense mobilized online coping resources are an intermediary outcome, which may subsequently affect subjective well-being and other ultimate outcomes. Future research may utilize more direct measurements of beneficial outcomes.

Despite these shortcomings, we think that we have taken a few steps in the direction of a better understanding of who profits from Internet use and who does not. Although our findings point to some educational differences in online outcomes, these differences are smaller than those in offline outcomes. In this sense, they are supportive of the idea that the Internet contributes to empowerment of citizens (somewhat) independent of their educational background. This is important news for social policy makers and social workers who want to make sure that all citizens have access to resources that can improve quality of life. We hope that future research will be able to reproduce these findings in other countries, as well as test the framework we presented on other outcomes.

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References


Gundersen, T. (2011). ‘One wants to know what a chromosome is’: The internet as a coping resource when adjusting to life parenting a child with a rare genetic disorder. *Sociology of Health & Illness, 33*(1), 81–95. doi:10.1111/j.1467-9566.2010.01277.x


StataCorp. (2013). *Stata user’s guide – release 13.* College Station: Stata Press.


