Son, you're smoking on Facebook! College students' disclosures on social networking sites as indicators of real-life risk behaviors

Joris J. van Hoof *, Jeroen Bekkers, Mark van Vuuren

University of Twente, Faculty of Behavioral Sciences, The Netherlands

A B S T R A C T

Health risk behavior in student populations is an issue of major concern, and students' risk levels are difficult to determine. In this study, we explore the extent to which information disclosed publicly on Facebook provides reliable indications of five real-life health behaviors.

Questionnaire data and Facebook contents (2928 items) on alcohol use, smoking, illicit drug use, (un)healthy nutrition, and participation in sports of 71 respondents were collected and analyzed.

The study shows that one can analyze Facebook profiles to reliably associate profile owners' smoking and sport behavior. It also shows that regarding alcohol use, some Facebook profile elements are indicative of real-life drinking.

We discuss and suggest improved methods of coding disclosed public data, which may lead to reliable indications of peoples' real-life behavior.

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1. Introduction

When students leave home to attend college, they are confronted with a range of challenges, opportunities, freedoms, and fears. Although some people might argue that experience without learning is better than learning without experience, behavior of students can interfere with a responsible, healthy lifestyle. Unfortunately, students are generally known for their unhealthy lifestyles, and for engaging in a variety of severe health-risk behaviors (American College Health Association, 2006; American College Health Association, 2009; Douglas et al., 1997). These risk behaviors may involve (excessive) alcohol, tobacco, and illicit drug use; poor dietary habits; and a lack of sports participation. Risk behaviors are associated with a range of serious social and physical consequences, including poor academic achievement and performance (Kristjánsson, Sigfusdottir, & Allegrante, 2010; Trockel, Barnes, & Egget, 2000; Wolaver, 2002; Yamada, Kendix, & Yamada, 1996); obesity (Suter et al., 1997; Van Kranen and Harbers, 2009; Wannamethee, Field, Colditz, & Rimm, 2004; Wannamethee and Shaper, 2003; Wendel-Vos, 2010); injury, accidents, crime, and violence (Corrao, Bagnardi, Zambon, & La Vecchia, 2004; Ellickson, Tucker, & Klein, 2003; Harrison, Kelly, Lindsay, Advocat, & Hickey, 2011; Hingson, Heeren, Zakocs,

Kopstein, & Wechsler, 2002; Lowry et al., 1999; Van Laar and Schoemaker, 2010; Wechsler, Davenport, Dowdall, Moeykens, & Castillo, 1994); unemployment and lower wages post-college (Ellickson et al., 2003; Jennison, 2004); greater risk of several forms of cancer, lung, liver, and heart diseases, and STDs (Corrao, Bagnardi, Zambon, & Arico, 1999; Corrao et al., 2004; Jones and Haynes, 2006; Rehm et al., 2003; Spencer, 2002; Van Kranen and Harbers, 2009; Wendel-Vos, 2010; Zeegers and Harbers, 2011); and even mortality (Bloss, 2005; Single, Robson, Rehm, & Xie, 1999; Wendel-Vos, 2010; Zeegers and Harbers, 2011).

Of course, not all students engage in risk behaviors, but since this group does have higher chances of being at risk, students are in the eye of the healthcare industry. Healthcare professionals aim at attaining the earliest identification of risk behaviors, to conduct treatment activities when the damage is still low and change is still possible. A variety of screening tools is available to identify those individuals who are at risk of health problems due to patterns of alcohol or other substance use, dietary habits, or physical (in)activity. These screening tools are an effective way to minimize harm by identifying college students at risk, and by providing appropriate interventions. These tools also indicate both the extent of the problem and trends in the development of the problem, which can be useful for health service strategies and policy-making (Griffiths, Stone, Tran, Fernandez, & Ford, 2007). However, a complication arises for healthcare professionals working with student populations. Students simply do not always care about their lifestyles, and the long-term consequences of substance use and

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* Corresponding author. Address: University of Twente, Faculty of Behavioral Sciences, P.O. Box 217, 7500 AE Enschede, The Netherlands. Tel.: +31 53 489 6131.

E-mail address: j.j.vanhoof@utwente.nl (J.J. van Hoof).

poor eating habits; thus, they do not always utilize the screening methods or preventive healthcare methods that are provided by health organizations.

However, students do care about something else: making information about their lifestyles publicly accessible on the internet (Valkenburg and Peter, 2009). An examination of Facebook raises legitimate questions about the extent to which pictures and other content relate to real-life health behaviors. Timely recognition of emerging risks enables early risk management interventions and better chances of preventing serious health problems (Wiedemann, Clauberg, Karger, & Henseler, 2005). Therefore, unobtrusive screening methods like finding cues on the internet of risky behavior may be a relevant tool for risk prevention (cf. Heyman, 2010). Our question thus became: Can we use popular social networking sites (SNSs) as screening and identification tools for health risk behaviors in student populations?

The use of social networking sites—mainly as tools for fast and easy information sharing with friends and acquaintances—has intensified in recent years (boyd and Ellison, 2007). However, information posted on SNSs for friends and acquaintances is sometimes also available to strangers, whose use of the content can have negative consequences for the owner of the SNS profile. For instance, students were suspended or criminally charged based on information disclosed on their SNS profiles (Brady, 2006; NRC (27 March, 2012). Research has also shown that SNS profiles are often used to assess their owners' employment candidacy (Clark and Roberts, 2010; Van Wingerden, 2009), and on the other hand for strategic self-representation (Rui and Stefanone, 2013).

Despite the possible negative consequences of information-sharing, only a small number of students appear to be reserved about disclosing personal information online or conscious about the impressions they are making via their SNS profiles. The majority of students do not seem to consider or care about the negative consequences, and they regret the disclosure of personal information only when it is too late, such as when their profiles are not suitable for current or future employers to see (Acquisti and Gross, 2006; Christofides, Muise, & Desmarais, 2009; Peluchette and Karl, 2008). On the other hand, there are positive consequences of engaging in SNS. Students use SNS to gain a sense of identity (Valkenburg and Peter, 2009). As social conformism is one of the primers of unhealthy behavior (Laghi, Liga, Baumgartner, & Baiocco, 2012), a socially sensitive context as Facebook could well be used to show one's conformism to what a group deems sturdy. As the saying goes, "A picture is worth a thousand words." This could be one of the reasons why many students' SNS profiles contain content that is applauded by a group, but problematic in terms of health behavior: substance (ab)use, violence, sexual activities, or other health risks. In their study of the profiles of 270 adolescents, Moreno, Parks, Zimmerman, Brito, and Christakis (2009) found that over half of the profiles (54%) contained such risk behavior information; 41% of all profiles contained alcohol references, 24% contained sexual behavior references, and 14% contained references to violence. These findings are consistent with previous research by Moreno, Parks, and Richardson (2007), in which almost half of the profiles (47%) contained indications of risk behavior, and these findings are even exceeded by results from later research by Moreno, Briner, Williams, Brockman, Walker, and Christakis (2010) which showed that over half of SNS profiles (56%) contained references to alcohol use.

Despite the fact that SNS profiles appear to provide valid structures for communicating personality (Back et al., 2010; Gosling, Gaddis, & Vazire, 2007; Hall & Pennington, 2013), it is still necessary to examine the extent to which self-disclosed health behaviors on these profiles are reliable indicators of *real-life* health risks. Recently, Moreno, Christakis, Egan, Brockman, and Becker (2012) took a first step in using self-disclosed SNS content as a predictor of an alcohol problem, by connecting alcohol and intoxication references on Facebook to AUDIT problem drinking questionnaire scores. The aim of our study was to broaden that scope and to further explore whether Facebook profiles provide reliable indications of a range of profile owners' health behaviors. We analyzed the content of students' Facebook profiles regarding the five health behaviors that are most relevant to an assessment of their health risks: alcohol use, tobacco use, illicit drug use, nutrition, and participation in sports (American College Health Association, 2006; American College Health Association, 2009; Douglas et al., 1997). We then compared our findings to the students' scores on a self-reported questionnaire regarding these five risk behaviors. This comparison enabled us to explore the power of public Facebook profile information to predict health risk behaviors.

2. Methods

We used a within-subject design utilizing an online questionnaire and a content analysis of each respondent's Facebook profile. First, respondents were invited to complete the online questionnaire, and they were also asked to provide the online address of their personal Facebook profiles. When the respondent provided a link to his or her profile (81% of respondents did this), the profile's contents were saved within two days of the respondents completing the questionnaire. Subsequently, the contents (maximum of twenty photos, maximum of ten status updates, and all profile details) were coded using a pre-tested coding scheme (average Cohen's kappa .77).

2.1. Questionnaire

The online questionnaire consisted of three sections with a total of 55 items. After the introduction, six questions were asked about demographics (sex, age, educational level, nationality, body length, and body weight). The link to the respondent's Facebook profile was also requested in this section. In the instructions, the purpose of the study was explained, and the respondent was asked to provide the ID code that is depicted in the URL when he or she is logged in at Facebook. The second section of the questionnaire involved the five dependent health behaviors; alcohol use (18 items, explained below), tobacco use (3 items), illicit drug use (2 items), nutrition (10 items), and participation in sports (1 item). The third section of the questionnaire consisted of 10 items measuring a broad range of possible consequences, including the respondent's frequency of oversleeping, frequency of sick days, grade point average, number of dental cavities at his or her last dental check-up, frequency of positive remarks on his or her appearance, average hourly wage at a part-time job, frequency of work-performance-related compliments given by his or her manager, frequency of work-performance-related criticism by his or her manager, whether the respondent had been given a raise in the past year, and the respondent's level of happiness according to the 5-item Satisfaction With Life Scale (Diener, Emmons, Larsen, & Griffin, 1985).

2.1.1. Alcohol use

Alcohol use was measured by three different validated scales: *Alcohol Quantity–Frequency* (average number of week and weekend days on which the respondent consumed alcohol * the average number of alcoholic drinks consumed on those days); *Alcohol Use Disorders Identification Test* (*AUDIT*) (ten items measuring frequency of engaging in, and suffering from, hazardous and harmful alcohol consumption, Cronbach's alpha = .78); and *alcohol risk behavior* (originally four items, based on previous research on alcohol risk behavior among adolescents and college students) (Adams and Nagoshi, 1999; Casey and Dollinger, 2007; Moreno