



## A social network analysis of substance use among immigrant adolescents in six European cities



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### ABSTRACT

**Background:** Social integration and the health of adolescents with a migration background is a major concern in multicultural societies. The literature, however, has paid little attention to the wider determinants of their health behaviours, including the composition of their social networks. The aim of this study was to describe the composition of adolescents' social networks according to migration background, and to examine how social networks are associated with substance use.

**Method:** In 2013, the SILNE study surveyed 11,015 secondary-school adolescents in 50 schools in six European cities in Belgium, Finland, Germany, Italy, the Netherlands, and Portugal, using a social network design. Each adolescent nominated up to five of their best and closest friends. Migration status was defined as first-generation migrants, second-generation migrants, and speaking another language at home. We computed two groups of network structural positions, the centrality of individual adolescents in networks, and the homophily of their social ties regarding migration (same-migration). Multilevel logistic regression was used to model the association between network structural position and smoking, alcohol use, and cannabis use.

**Results:** Compared with non-migrant adolescents, adolescents with migration backgrounds had similar relationship patterns. But almost half their social ties were with same-migration-background adolescents; non-migrants had few social ties to migrants. For adolescents with a migration background, a higher proportion of social ties with non-migrants was associated with increased use of cannabis (OR = 1.07,  $p = 0.03$ ) and alcohol (OR = 1.08,  $p < 0.01$ ), but not with increased smoking ( $p = 0.60$ ). Popular migrant adolescents were at less risk of smoking, alcohol use, and cannabis use than popular non-migrant adolescents.

**Conclusion:** Homophily of social ties by migration background is noticeable in European schools. The tendency of migrant adolescents to have same-migration social ties may isolate them from non-migrant adolescents, but also reduces their risky health behaviours, in particular cannabis and alcohol use.

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### 1. Introduction

First- or second-generation migrant adolescents (hereafter, adolescents with a migration background) account for a quarter of all school-age adolescents in Europe (Inchley et al., 2016). It is

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estimated that the number of immigrants arriving in European countries will increase over the next decade (Brady, 2008).

Several studies have assessed substance use among adolescents with a migration background. The findings of these studies, which have largely focused on the situation of Hispanics, and other migrant groups in the US, are inconclusive (Almeida et al., 2012; Castañeda et al., 2015; Georgiades et al., 2006; Gil et al., 2000; Kim et al., 2002; Lara et al., 2005; Lorenzo-Blanco et al., 2011; Prado et al., 2009; Yu et al., 2003). Some have suggested that adolescents with a migration background are more likely than their counterparts without a migration background to adopt risky health behaviours (such as drinking alcohol and smoking cigarettes or marijuana) (Brindis et al., 1995; Delforferie et al., 2014; Prado et al., 2009; Walsh et al., 2014). However, other studies have found the opposite, reporting that adolescents with a migration background exhibit lower risk of substance use in general (Flavio Francisco Marsiglia et al., 2008; Molcho M et al., 2006), report lower rates of smoking (Georgiades et al., 2006), and are less likely to drink alcohol (Brandom, 2008) than non-immigrant adolescents.

Different factors have been associated with the adoption of substance use behaviours among adolescents with a migration background. Most studies assessed the role of cultural factors such as acculturation or linguistic factors and individual or psychological stressors associated with the migration process (Almeida et al., 2012; Castañeda et al., 2015; Chen et al., 2000; Cheung, 2014; Eitle et al., 2009; Gil et al., 2000; Gordon-Larsen et al., 2003; Lara et al., 2005; Rostila, 2010; Warner et al., 2010). Yet, as argued elsewhere, research on migration and health may have over-emphasised the role of cultural factors (including, among others, values and beliefs) and it may instead need a better understanding of the role of structural social determinants of health (Castañeda et al., 2015).

One such social determinant of health is the adolescent's social network. It is now well acknowledged that adolescents tend to adopt health behaviours that are similar to their friends' behaviours, and this has been shown in a range of domains such as substance use, nutrition, and sexual activity (Ajilore, 2015; Clark and Loheac, 2007; Ennett et al., 2006; Kobus, 2003; McGloin et al., 2014; Simons-Morton and Farhat, 2010; T. W. Valente et al., 2004). Moreover, exposure to substance use is associated with the structural position of an adolescent in the network. Studies suggest that those with more friendships are more likely to smoke or to drink than those with fewer friends (Balsa et al., 2011; Ennett et al., 2006; Fujimoto and Valente, 2012; Huang et al., 2014; Mundt, 2011; Osgood et al., 2014; Tucker et al., 2011).

However, there has been little research on the role of social networks in the health behaviours of adolescents with a migration background. A particular challenge to such research is to take into account the demographic composition of the social networks. Adolescents' friends are not chosen at random: an adolescent is more likely to befriend other adolescents of the same gender, socio-economic status, and, relevant to the present study, migration or ethnicity, a pattern known as "homophily" (McPherson et al., 2001; Noel and Nyhan, 2011; Rivera et al., 2010). Homophily has been defined as "a tendency for friendships to form between those who are alike in some designated respect" (Rivera et al., 2010). For adolescents with a migration background, homophily may be a double-edged sword, i.e. with both positive and adverse consequences.

On the positive side, homophily can be a source of social support and can help to decrease exposure to prejudice and racial discrimination (Lorenzo-Blanco et al., 2011). It also protects identity, facilitates trust and social interaction, and provides power to resist othering (Hjern et al., 2013). Research in Australia also shows

that immigrant adolescents who had peers with a similar migration background reported lower alcohol or tobacco use than their non-immigrant counterparts (Brandom, 2008). Homophily of social relationships in adolescents with a migration background may thus protect them from predominant social norms involving risky behaviours such as smoking, drinking, or drug use (Hernandez et al., 1998; Lara et al., 2005).

On the negative side, homophily may have negative implications for adolescents with a migration background, as it may affect their socio-economic opportunities (Lorant and Bhopal, 2011) and their social capital. Some studies indicate that adolescents with a migration background in schools with a larger proportion of pupils who are non-migrants are more likely to have relational problems with their peers at school (Derluyn et al., 2008; Murad et al., 2003). Others have shown that homophilous adolescents had poorer social integration, reinforcing the lower social position of migrant groups (Yu et al., 2003), fostering prejudice (Aboud et al., 2003), and, finally, limiting access to health services (McPherson et al., 2001). This may have detrimental consequences for health behaviours as well.

Thus, for adolescents with a migration background, having peers with a migration background may have an effect that depends on the implications of homophily. Homophily may be protective against risky behaviours, depending on how much the behaviour is associated with prevailing norms (Coleman, 1988; Portes, 1998). By insulating adolescents with migration background, homophily may keep these adolescents away from the prevailing substance use norms, as suggested elsewhere with adults (Rostila, 2010). So far, there have only been a few empirical studies describing social homophily according to migration background and its association with substance use. Some previous studies suggested that adolescents with a migration background had a substance use pattern which was vulnerable to their peers' substance use (Delforferie et al., 2014; Kim et al., 2002; Walsh et al., 2014). Those studies, however, did not use a social network design, and thus had an indirect appraisal of peers' substance use; those studies, moreover, had a more limited range: they were limited to one migrant or ethnic group, to a national or regional context, and generally analysed only one substance. To our knowledge, there is no social network study describing adolescents' social ties according to migration background and their effect on different health behaviours. This paper aims to fill this gap in two steps. First, we examine the structural position of adolescents in their networks according to their migration background in six European cities. Second, we estimate the association between the structural position of their relationships and their substance use.

## 2. Method

### 2.1. Data

We used data from the SILNE study: a whole-network study whose detailed design, including ethical review, has been presented elsewhere (Lorant et al., 2015). The survey was administered between January and November of 2013 to adolescents in 50 schools in six European cities of similar population size and income and with employment rates close to the national average. The cities were Namur (Belgium), Tampere (Finland), Hanover (Germany), Latina (Italy), Amersfoort (the Netherlands), and Coimbra (Portugal). In each city, schools were selected from the local register of schools and were approached to participate. Ethical approvals were obtained from national and local organisations. In each school, two grades, corresponding to 14–16 year-olds, were selected. All registered students in these grades were invited to fill in a written questionnaire about their social relationships in school,

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