Chapter 3
Recent cannabis use among adolescent and young adult immigrants in the Netherlands – the roles of acculturation strategy and linguistic acculturation.

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ABSTRACT

**Background:** The present study examined the relation between two different acculturation measures (i.e., linguistic acculturation and the acculturation strategies integration, separation and marginalization) and past year cannabis use. Additionally, we studied the mediating role of affiliation with cannabis-using peers.

**Method:** Data were utilized from i4culture, a Dutch study on immigrant adolescents and young adults aged 15 – 24 years. Participants belonged to the five largest immigrant populations in the Netherlands, living in or around the four major Dutch cities: Amsterdam, the Hague, Rotterdam, and Utrecht. In total, 771 adolescents and young adults (mean age 19.29, SD = 2.61, 53.8% female) from Surinamese (n = 210, 27.2%), Moroccan (n = 209, 27.1%), Turkish (n = 110, 14.3%), Antillean (n = 109, 14.1%), and Asian (n = 133, 17.3%) backgrounds participated. With questionnaires, past year cannabis use, acculturation strategy, linguistic acculturation, and affiliation with cannabis-using peers were assessed.

**Results:** Using logistic regression analyses, we found no relation between acculturation strategy and past year cannabis use (OR = 1.25, p = .38 for separation vs integration and OR = 0.86, p = .50 for marginalization vs integration). Linguistic acculturation was positively related to cannabis use (OR = 2.20, p < .01). Affiliation with cannabis-using peers partly mediated this relation (OR = 1.09, p < .01).

**Conclusions:** Non-Western immigrant youngsters who speak the host culture’s language at home are more likely to use cannabis than youngsters who speak their native language at home. The former group is more likely to affiliate with cannabis-using peers, which partly explains their increased risk of cannabis use.

**Key words:** Cannabis use; Acculturation; Non-Western immigrant adolescents and young adults; the Netherlands
INTRODUCTION
In Western society, cannabis is the most widely used illicit drug (Degenhardt et al., 2008), with onset of use peaking in middle and late adolescence (Vega et al., 2002). Because cannabis use (CU) has been negatively related to mental health and educational attainment (Van Ours & Williams, 2009; 2011), elucidating the mechanisms underlying CU is an important step in developing interventions targeting cannabis (ab)use.

During adolescence, teenagers born of immigrant parents are likely to experience identity conflicts, stress and insecurity, which could enhance their risk for deviant behavior and substance use (Unger et al., 2004). Acculturation, i.e. the degree of cultural maintenance and adaptation to the host culture, seems important for determining a person’s risk in terms of mental health problems, well-being and substance use (Koneru, Weisman de Mamani, Flynn, & Betancourt, 2007). The cultural values paradigm (Unger et al., 2004) is a conceptual framework for understanding substance use in a cultural context. According to this paradigm, cultural values of the host country shape attitudes and behaviors towards substance use, thereby promoting or protecting against substance use. Consequently, becoming more acculturated to a culture with more positive values toward substance use will increase the risk of substance use (Unger et al., 2004).

However, empirical evidence for the association between acculturation to a country with substance-use-promoting values and CU is lacking, as previous studies have yielded inconsistent findings (e.g. Chédebois et al., 2009; Marsiglia et al., 2011). Differences between these studies in measures of acculturation and CU seem to-at least partially- explain these inconsistencies. When the focus is on multidimensional models of acculturation, encompassing both maintenance of the cultural identity of the country of origin and adoption of the cultural identity of the host country, most studies have adopted the four acculturation strategies proposed by Berry (1997). Assimilation, i.e. replacing the native cultural orientation with the host culture orientation; and integration, i.e. combining aspects of the host culture with aspects of the native culture, are both characterized by relatively high levels of adoption of the cultural identity of the host country. Separation, i.e. retaining the native cultural orientation while rejecting the host culture orientation; and marginalization, i.e. rejecting both cultures, are both marked by low levels of...
adoption of the cultural identity of the host country. Studies focusing on these acculturation strategies and adolescent CU are scarce, and findings do not support the cultural values perspective. For instance, although Latino immigrants living in the United States (US) report higher rates of substance use than Latinos living in their country of origin (Cherpitel & Borges, 2001; Félix-Ortiz, Velazquez, Medina-Mora, & Newcomb, 2001), and although their risk of substance use increases the longer they remain in the US (Epstein, Botvin, Dusenbury, Diaz, & Kerner, 1996), more acculturation was not related to a greater risk of substance use (Fosados et al., 2007). In contrast, marginalization (rejecting both cultures) was associated with higher prevalences of lifetime drug use (including cannabis) in males and of current drug use in females (Fosados et al., 2007). Also, recent CU among immigrant adolescents living in France was not associated with any of the acculturation strategies, and frequency of CU was negatively associated with more acculturation (i.e. integration and assimilation) (Chédebois et al., 2009).

In the study of Chédebois et al. (2009), language use was used to define acculturation strategy (i.e., linguistic acculturation). Linguistic acculturation, a strong indicator of acculturation (Rogler, Cortes, & Malgady, 1991; Serrano & Anderson, 2003), has been studied in unidimensional models, defining acculturation as the adoption of values, attitudes and behaviors of the host country (Berry, Trimble, & Olmedo, 1986). Results from studies focusing on unidimensional linguistic acculturation are somewhat more consistent and supportive of the cultural values paradigm, indicating that strong acculturation (the host culture’s language is the dominant language at home or with friends) was positively associated with lifetime CU among Asian adolescent immigrants in the US (Thai, Connell, & Tebes, 2010) and with frequency and quantity of CU among Hispanic/Latino adolescent immigrants in the US (Epstein, Botvin, & Diaz, 2001; McQueen, Greg Getz, & Bray, 2003). However, not all studies have yielded consistent results: among Mexican youngsters living in the US, linguistic acculturation was only positively related to lifetime CU in boys (Marsiglia et al., 2011). It should be noted that, given the historical context of Mexicans living in the US (Telles & Ortiz, 2008), it is unclear if this finding can be generalized to other immigrant groups. In sum, results from previous research on the association between acculturation and adolescent CU are inconsistent. However, prior studies on unidimensional linguistic acculturation
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suggest that non-Western immigrants living in a Western host culture are at increased risk of CU.

For understanding the link between acculturation and substance use, the cultural values paradigm emphasizes the role of peers. As adolescents acculturate, they are more likely to spend time with more acculturated or native peers who have adopted a more tolerant attitude towards substance use (Unger et al., 2000). This increases the likelihood of exposure to peer substance use and to peer influences promoting substance use. Indeed, Thai et al. (2010) demonstrated in a sample of Asian immigrants living in the US that acculturation to a culture with positive values regarding substance use affects the likelihood to affiliate with substance-using peers, which is strongly associated with adolescent substance use, including cannabis (Bernburg, Thorlindsson, & Sigfusdottir, 2009; Creemers et al., 2010; Oetting & Beauvais, 1987; Pinchevsky et al., 2012). It is yet unclear if this finding can be generalized to other immigrant groups.

Because various components of acculturation (e.g. language use, maintenance of the cultural identity of the country of origin, adoption of the host country’s cultural identity) seem important for adolescent CU, the current study focuses on the multidimensional acculturation strategies proposed by Berry (1997) and on unidimensional linguistic acculturation of adolescent and young adult immigrants moving from a non-Western culture to the Netherlands, in relation to past year CU. As even occasional use (i.e. less than weekly use in the past 6 months) in adolescence increases the risk of alcohol and nicotine dependence and educational problems at age 24 (Degenhardt et al., 2010), identifying risk factors of occasional CU is important. The aims of the current study are to (a) assess the association between acculturation strategies, linguistic acculturation and past year CU and (b) to understand the mediating role of affiliation with cannabis-using peers. To that end, a sample of Dutch adolescents and young adults from Surinamese, Moroccan, Turkish, Antillean and Asian backgrounds, the largest ethnic populations in the Netherlands (www.cbs.nl) will be examined. The Indonesia-Asian, Surinamese and Antillean immigrants originate from former Dutch colonies, and immigrated to the Netherlands in the nineteen-forties, nineteen-seventies and nineteen-nineties, respectively. Chinese-Asian, Moroccan and Turkish immigrants came to the Netherlands in the nineteen-thirties and -sixties, respectively. In Suriname and the
Antilles, the native population also learned to speak Dutch, while maintaining their mother tongues.

It is particularly interesting to study the cultural values paradigm in the Netherlands, as the Dutch legal system has de-penalized CU and possession for those aged 18 years and older, resulting in a relatively tolerant attitude towards CU. Prevalence rates have shown that immigrant Dutch adolescents use less cannabis than native Dutch adolescents (Van Dorsselaer et al., 2010). In accordance with the cultural values paradigm, we expect that immigrants who are more attached to the Dutch culture and less to their culture of origin (those with an assimilated acculturation strategy or who speak Dutch) are more likely to report past year CU. Furthermore, we expect that these youngsters affiliate more with cannabis-using peers, mediating the association between acculturation and CU.

METHOD
Sample and Respondents
The present study reports data from the i4culture project, conducted from October 2010 to March 2013. Participants are 771 Dutch adolescents and young adults (mean age 19.29, SD = 2.61, 53.8% female) from Surinamese (n = 210, 27.2%), Moroccan (n = 209, 27.1%), Turkish (n = 110, 14.3%), Antillean (n = 109, 14.1%), and Asian (n = 133, 17.3%) backgrounds, living in or around the four major cities in the Netherlands: Amsterdam, the Hague, Rotterdam, and Utrecht.

Participants were recruited via schools, on the streets or at other public areas like malls and subway or railway stations. Schools were selected based on high percentages of immigrant students. Two schools gave permission to administer questionnaires in the classroom. Another six schools gave permission to recruit respondents in the school building.

Participants were included in the sample if they met the following criteria: a) age between 15 – 24 years, b) resident in the urban part of the Netherlands, and c) having a Surinamese, Moroccan, Turkish, Antillean, or Asian background. First, second and third generation immigrants were included in this study, and ethnic backgrounds were determined by country of birth of the participant, of (one of) the parents, or of both grandparents from one side of the family. Participants originating from South-East Asia (e.g. Indonesia) or China were classified as Asians.
Participants originating from the Greater or Lesser Antilles were classified as Antillean.

All respondents completed a questionnaire either on paper (in classroom) or through the Internet (accessible via a link sent by e-mail). Confidentiality was emphasized by reassuring respondents that only the researchers would have access to the information they provided and data would be processed anonymously by substituting names with numbers. Completing the questionnaire took approximately 45 minutes, and respondents were rewarded with a gift voucher sent to their home address. Informed consent was obtained from all respondents after the nature of the study had been explained. In addition, parents of under-aged participants were informed about the study through regular mail, and were given ample opportunity to object to their child’s participation. The ethical board of the University of Amsterdam approved of this study.

Measures
Cannabis use. Past year CU was assessed with the question “How many times have you used cannabis in the past 12 months?”. Response options ranged from 0 to 40 times or more. Because of skewness of the variable (76.5% of the sample reported no past year CU), we dichotomized the answers into (0) No past year CU, and (1) Past year CU.

Acculturation. Acculturation strategy was measured by an adapted version of the Psychological Acculturation Scale (Tropp, Erkut, Coll, Alarcon, & García, 1999). In this version, seven items pertained to the sense of belonging and emotional attachment to the Dutch people and culture ($\alpha = 0.82$, e.g. “Dutch people understand me”), and five items to the native people and culture ($\alpha = 0.83$, e.g. “I feel comfortable with … people”). Respondents were asked to substitute the dots by their ethnic background. Response options ranged from (1) Completely disagree, to (5) Completely agree. We conducted a Latent Class Analysis to identify the acculturation strategies present in our sample, and each individual’s membership to one of the acculturation strategies. For linguistic acculturation, we used the question “What language do you speak at home?” with response options (1) language of the native culture, (2) Dutch language, and (3) other(s), specify. We recoded response options into (0) Language of the native culture, and (1) Dutch
language. Respondents who reported speaking both languages were classified as speaking the language of the native culture. Answers to this question on linguistic acculturation have been found to correlate significantly \((r = .49)\) with a parents’ 10-item acculturation scale in Hispanic adolescents (Epstein et al., 1996).

**Affiliation with cannabis-using peers.** To assess affiliation with cannabis-using peers, respondents were asked how many of their friends use cannabis, with response options (1) *No one*, (2) *A couple*, (3) *Half*, (4) *Most*, and (5) *Everyone*.

**Alcohol/tobacco use.** Alcohol and tobacco use were measured with the questions “How old were you when you first drank alcohol/smoked a cigarette?” Answers were dichotomized into (0) *No alcohol/tobacco use* or (1) *Lifetime alcohol/tobacco use*.

**Islamic religion.** To control for Islamic religion, we included the question “What is your religion?”, and dichotomized it into (0) *Not Islamic* or (1) *Islamic*.

**Statistical Analysis**
Statistical analyses were performed using the Statistical Package of Social Sciences version 20.0 for Windows (SPSS Inc., Chicago, IL) and Mplus 6.11 (Muthén & Muthén, 1998-2012). For descriptive purposes, means and percentages of variables used in this study were ascertained per ethnic group. Gender differences in CU, linguistic acculturation and acculturation strategies were tested using chi-square tests. Next, we conducted a Latent Class Analysis (LCA) to identify the acculturation strategies in our sample (McCutcheon, 1987). In LCA, the smallest number of classes is found to identify individuals with “profiles” of acculturation that are equal across all members of that particular class. Classes are added stepwise until the model optimally fits the data. For a given latent class model, parameter estimates include class membership probabilities, which estimate the likelihood for respondents to belong to each of the classes. The Vuong-Lo-Mendell-Rubin likelihood ratio test was used to decide how many classes fit the data best (Lo, Mendell, & Rubin, 2001). With this ratio test, the number of classes \((k)\) is compared to \(k-1\) classes. A non-significant p-value means that the number of classes is no improvement over \(k-1\) classes. Respondents were assigned to one of the classes based on their class membership probability.
Next, we conducted separate logistic regressions to test the associations of acculturation strategy and linguistic acculturation with CU. Models were initially adjusted for age, sex, alcohol/tobacco use and Islamic religion. In order to achieve the most parsimonious model, non-significant covariates were excluded.

When direct associations between acculturation and CU were ascertained, we tested for mediation by affiliation with cannabis-using peers. To this end, we first regressed CU and the mediator variable on acculturation, to ascertain that direct associations of acculturation with affiliation with cannabis-using peers were present. Then, we specified a full mediation path model by additionally allowing a direct path from affiliation with cannabis-using peers to CU. To test for an indirect relation from acculturation to CU via affiliation with cannabis-using peers, a joint significance test of the indirect paths was used (Baron & Kenny, 1986; MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002; Sobel, 1982). To determine whether the final mediation model was a better representation of the data when compared to an additive model without indirect effects, model fit was compared using the Chi-square difference tests for Weighted Least Squares Means and Variance adjusted (WLSMV) estimation.

RESULTS
Sample characteristics
Past year CU was reported by 23.5% of the immigrant adolescents and young adults. In total, 34.3% of the Surinamese respondents reported past year CU, 28.4% of Antillean respondents, 27.1% of Asian respondents, 16.4% of Turkish respondents, and 11.5% of Moroccan respondents. Moroccan men were more likely than Moroccan women to report past year CU ($\chi^2 (df = 1, n = 209) = 7.33, p < .05$). There were no other gender differences in CU, linguistic acculturation and acculturation strategies within the ethnic groups (all $p > .05$). Differences per ethnic background and means of the unstandardized scores or percentages of the variables used are shown in Table 3.1.
<table>
<thead>
<tr>
<th></th>
<th>Surinamese</th>
<th>Moroccan</th>
<th>Turkish</th>
<th>Antillean</th>
<th>Asian</th>
</tr>
</thead>
<tbody>
<tr>
<td>Past year cannabis use</td>
<td>34.3%</td>
<td>11.5%</td>
<td>16.4%</td>
<td>28.4%</td>
<td>27.1%</td>
</tr>
<tr>
<td>Speaking Dutch at home</td>
<td>85.2%</td>
<td>29.7%</td>
<td>25.5%</td>
<td>40.4%</td>
<td>57.1%</td>
</tr>
<tr>
<td>Acculturation strategy</td>
<td>Separation 28.1%</td>
<td>S 34.4%</td>
<td>S 25.5%</td>
<td>S 33.9%</td>
<td>S 15.0%</td>
</tr>
<tr>
<td></td>
<td>Marginalization 41.9%</td>
<td>M 32.5%</td>
<td>M 40.9%</td>
<td>M 39.4%</td>
<td>M 39.1%</td>
</tr>
<tr>
<td></td>
<td>Integration 30.0%</td>
<td>I 33.0%</td>
<td>I 33.6%</td>
<td>I 25.7%</td>
<td>I 45.9%</td>
</tr>
<tr>
<td>Affiliation with cannabis-using peers</td>
<td>Mean = 2.11</td>
<td>M = 1.70</td>
<td>M = 1.64</td>
<td>M = 2.02</td>
<td>M = 1.97</td>
</tr>
<tr>
<td></td>
<td>(SD = 1.03)</td>
<td>(SD = 1.05)</td>
<td>(SD = 0.92)</td>
<td>(SD = 1.15)</td>
<td>(SD = 1.10)</td>
</tr>
<tr>
<td>Perceived parental influence</td>
<td>M = 3.49</td>
<td>M = 3.85</td>
<td>M = 3.81</td>
<td>M = 3.58</td>
<td>M = 3.70</td>
</tr>
<tr>
<td></td>
<td>(SD = 1.60)</td>
<td>(SD = 1.58)</td>
<td>(SD = 1.58)</td>
<td>(SD = 1.58)</td>
<td>(SD = 1.59)</td>
</tr>
</tbody>
</table>
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Acculturation strategy
Three strategies were represented in the data (see Table 3.2). Of the total sample, 28.1% \((n = 216)\) reported a strong bond with their native culture and a weak bond with the Dutch culture (separation), 38.4% \((n = 296)\) reported weak bonds with both Dutch and native culture (marginalization), and 33.5% \((n = 258)\) reported strong bonds with the Dutch and native culture (integration). We did not find evidence for an assimilationist strategy, (i.e. a strong bond with the Dutch and a weak bond with their native culture). In the following analyses, the integration strategy was therefore selected as the reference category.

The three strategies of acculturation were significantly associated with linguistic acculturation \(\chi^2(2) = 32.58, p < .01\). Speaking the language of the native culture at home was most common among youngsters assigned to the separation strategy (64.8%), followed by those assigned to the marginalization strategy (47.6%), and least common among those assigned to the integration strategy (38.8%).

Table 3.2
Vuong-Lo-Mendell-Rubin Likelihood Ratio test for the different classes

<table>
<thead>
<tr>
<th></th>
<th>VLMR LRT ( p )</th>
<th>Entropy</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 classes</td>
<td>&lt; .01</td>
<td>0.82</td>
</tr>
<tr>
<td>3 classes</td>
<td>&lt; .001</td>
<td>0.86</td>
</tr>
<tr>
<td>4 classes</td>
<td>.76</td>
<td>0.84</td>
</tr>
<tr>
<td>5 classes</td>
<td>.77</td>
<td>0.88</td>
</tr>
</tbody>
</table>

*Note.* The number of classes \(k\) is compared to \(k - 1\) classes. A non-significant \(p\)-value means that the number of classes is no improvement over \(k-1\) classes. Entropy measures how well each individual fits into a specific class. Values of entropy > 0.80 indicate high certainty in classifications.
Cannabis Use
When taking the significant covariate (alcohol/tobacco use) into account, acculturation strategy was not associated with past year CU (OR = 1.25, 95%CI = 0.76 – 2.04, $p = .38$ for separation vs integration and OR = 0.86, 95%CI = 0.55 – 1.34, $p = .50$ for marginalization vs integration). In contrast, linguistic acculturation was associated with a higher likelihood of CU (OR = 2.20, 95%CI = 1.47 – 3.28, $p < .01$), indicating that adolescents who speak Dutch at home were more likely to use cannabis.

Regarding a mediation effect of affiliation with cannabis-using peers, we found a significant positive association between linguistic acculturation and affiliation with cannabis-using peers ($\beta = .20$, $p < .05$), indicating that adolescents who speak Dutch at home were more likely to affiliate with cannabis-using peers. Subsequently, results from the full mediation model indicated that affiliation with cannabis-using peers mediated the association between linguistic acculturation and CU (OR = 1.09, 95%CI = 1.02 – 1.16, $p < .01$), leaving the direct association significant (OR = 1.44, 95%CI = 1.16 – 1.80, $p < .01$), indicating partial mediation. The mediation model fitted significantly better than the additive model with linguistic acculturation and affiliation with cannabis-using peers as predictors ($\chi^2 (1) = 7.71, p < .01$). The full model is depicted in Figure 3.1.

An $R^2$ proportion was calculated to determine the proportion of the total effect that was mediated by cannabis-using peers. This is an effect-size measure, where the squared correlation between acculturation and affiliation with cannabis-using peers (.21) is multiplied by the squared partial correlation between affiliation with cannabis-using peers and past year CU (.50), divided by the total amount of explained variance in past year CU by both acculturation and cannabis-using peers ($R^2 = 0.49$). The $R^2$ proportion showed an effect-size of .21, indicating a small effect.
DISCUSSION

This study investigated the relation of acculturation strategy and linguistic acculturation with past year CU in a sample of 15-24-year-old non-Western immigrants of whom 23.5% reported CU in the past year. This percentage is somewhat higher compared to an estimate of 16.1% among 15-24-year-olds from the general Dutch population (Van Rooij, Schoenmakers, & Van de Mheen, 2011). The difference may be explained by the higher level of urbanization in our sample, or could be due to methodological differences between the two studies. For example, in our study, most participants completed the questionnaire in the privacy of their home, instead of with the researcher present in the room. Our method might have reduced participants’ tendency to provide socially desirable answers.

The results of this study indicated that the acculturation strategies (Berry, 1997) were not related to past year CU in immigrant adolescents and young adults. However, speaking the hosts’ language at home was positively related to past year CU, confirming the results of previous studies (Epstein et al., 2001; McQueen et al., 2003). Given the tolerant attitude towards CU in the Netherlands, the positive association between linguistic acculturation and CU supports the cultural values paradigm (Unger et al., 2004). Following this line of reasoning, we also expected a...
higher likelihood of CU in individuals adopting the assimilation strategy. However, this strategy could not be distinguished in our sample, and therefore this hypothesis could not be tested. Apparently, adolescent immigrants in the Netherlands who (partially) adopt the Dutch cultural identity also retain a substantial part of the cultural identity of their country of origin, which is consistent with previous research in the Netherlands (Andriessen & Phalet, 2002; Bélanger & Verkuyten, 2010; Stevens, Pels, Vollebergh, & Crijnen, 2004; Stevens, Vollebergh, Pels, & Crijnen, 2007). Individuals adopting the integrationist strategy, which is also characterized by a sense of belonging to the host culture, were –when compared to individuals with low levels of adoption of the cultural identity of the host country (separation and marginalization)– not more likely to use cannabis. Possibly, retaining the norms and values of their culture of origin, where CU is less tolerated than in the Netherlands, protects these individuals against CU.

Previous research on acculturation strategies and adolescent substance use does not support the cultural values paradigm (Chédebois et al., 2009; Fosados et al., 2007). Instead, initial evidence is provided for an increased risk of substance use (including cannabis) among youngsters adopting the marginalization strategy, i.e. who reject both cultures (Fosados et al., 2007). As Berry concluded that the marginalization strategy is most stressful compared to the other strategies, the stress-coping paradigm (Unger et al., 2004) may explain this finding. According to this paradigm, stressful experiences during the acculturation process may increase the risk of substance use when coping skills are insufficient. Our findings, however, do not support, the stress-coping paradigm.

Affiliation with cannabis-using peers partly mediated the relation between linguistic acculturation and CU, although the effect size was small. This implies that the increased risk of CU in adolescents who are more linguistically acculturated was partly explained by their higher tendency to affiliate with cannabis-using peers. Affiliation with substance-using peers has been identified as a risk factor of substance use in different populations and for various substances of abuse (Hahm, Lahiff, & Guterman, 2004; Le, Goebert, & Wallen, 2009; Thai et al., 2010). Unger et al. (2000) have suggested that linguistically acculturated adolescents are more likely to spend time with highly acculturated or native peers who have adopted the norms of the host culture regarding substance use, which may increase the exposure
to pro-substance peer influences and to peer substance use. As we did not assess the 
peers’ culture of origin or acculturation level, we could not test this pathway. Future 
research might further clarify this relation by looking at cultural background and 
norms and values regarding substance use of adolescent peers.

Another interesting finding of this study is that past year CU was equally 
likely among men and women within each of the ethnic groups, except for 
Moroccan men who were more likely to have used cannabis than Moroccan women. 
Previous research has shown that women are catching up on men regarding 
substance use in most European Western countries, while in non-Western countries 
substance use is still more prevalent in men than women (Degenhardt et al., 2008). In most of the ethnic subgroups of our study, this pattern of a narrowing gap 
between the genders seems present as well. It might be interesting to further 
examine why particularly youth with a Moroccan background show a more 
traditional gender gap.

Some limitations of this study should be mentioned. First, consistent with 
previous research (e.g. Epstein et al., 2001; Unger et al., 2000), linguistic 
acculturation was defined as speaking Dutch or the language of the native culture at 
home. Respondents who reported speaking both languages were classified as 
speaking the language of the native culture, which could have affected our results. 
However, when recoding these bilingual respondents as Dutch language 
users, speaking Dutch at home was still associated with a higher likelihood of past year 
CU. Additionally, more elaborate measurements of language use, for example 
including language use with friends (Marsiglia et al., 2011), would have provided 
the opportunity to further distinguish immigrants based on their linguistic 
acculturation levels. Second, given the relatively small sample sizes of the 
individual immigrant groups, we did not distinguish between different ethnic groups. 
Possibly, historical, political or social differences between the immigrant groups 
affected acculturation processes. Although Unger et al. (2000) demonstrated similar 
acculturation processes between Hispanic and Asian adolescents living in the US, it 
is unclear whether this also applies to Dutch immigrant adolescents. Third, although 
CU is not prosecuted in The Netherlands, therefore possibly reducing false-negative 
reporting contrary to other countries, less acculturated immigrants might be more 
likely to underreport CU. We could not confirm the questionnaire data on CU with
biomedical information, although these measures might be biased toward long-term or heavy users (El Marroun et al., 2011). We were, however, able to test the reliability of the data in a subsample of our cohort that was invited to participate in a one-on-one diagnostic interview. In this subsample consisting of 194 individuals, similar responses were obtained in 92% of the participants. Additionally, controlling for social desirability (Crowne & Marlowe, 1960) in the analyses showed equal results. As other studies show acceptable reliability of self-reported CU (e.g. Fendrich et al., 2004; Ramo, Liu, & Prochaska, 2012), and our percentage of CU is in fact higher than prevalence rates of Dutch adolescents and young adults in a general population study (Van Rooij et al., 2011), we are reasonably confident of the reliability of our data. Last, because of the cross-sectional design of this study, it is impossible to draw conclusions about causation. A longitudinal study could further enhance our knowledge on risk factors for CU in immigrant adolescents and young adults.

In conclusion, this study shows support for the cultural values paradigm, and demonstrates that linguistic acculturation is an indicator of past year CU in immigrant adolescents and young adults. The acculturation strategies identified in this sample were not related to CU. This study further shows that affiliation with cannabis-using peers partly explains the relation between linguistic acculturation and CU. The higher prevalence of CU in Western countries when compared to countries in the Middle East, Africa and Asia (Degenhardt, et al., 2008), suggests a more tolerant attitude in Western countries than in non-Western countries. As the composition of the immigrant group in other European countries shows some resemblance with the composition of the Dutch immigrant group (e.g. Turkish and Moroccan immigrants in Germany), our results seem generalizable to other European countries receiving non-Western immigrants. More research is needed to understand the link between acculturation and CU in other receiving countries around the world, and the mechanisms underlying this link.