



# Do social characteristics influence smoking uptake and cessation during young adulthood?

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Received: 12 May 2017 / Revised: 10 October 2017 / Accepted: 13 October 2017 / Published online: 29 October 2017  
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## Abstract

**Objectives** This study uses a Bourdieusian approach to assess young adults' resources and examines their association with smoking initiation and cessation.

**Methods** Data were drawn from 1450 young adults participating in the Interdisciplinary Study of Inequalities in Smoking, a cohort study in Montreal, Canada. We used logistic regression models to examine the association between young adults' income, education, and peer smoking at baseline and smoking onset and cessation.

**Results** Young adults where most or all of their friends smoked had greater odds of smoking onset. Young adults that had completed pre-university postsecondary education also had higher odds of smoking onset after controlling for social support, employment status, and lacking money to pay for expenses. Income and the sociodemographic variables age and sex were not associated with smoking onset. Young adults where half of their friends smoked or where most to all of their friends smoked had lowers odds of

smoking cessation. Men were more likely to cease smoking than women. Education, income and age were not associated with cessation.

**Conclusions** Interventions focusing on peer smoking may present promising avenues for tobacco prevention in young adults.

**Keywords** Young adults · Smoking · Smoking onset · Cessation · Social characteristics · Bourdieu

## Introduction

Tobacco smoking is one of the leading causes of mortality and morbidity (Lim et al. 2013). It is well established that people who smoke have higher risks of death from cardiovascular disease, cancer, diabetes, chronic obstructive pulmonary disease, and pneumonia (Carter et al. 2015). In Canada and the United States, young adults have the highest smoking prevalence of any age group (Statistics Canada 2016; US Department of Health and Human Services 2012). In addition, their cessation rates have not increased in the last 30 years and smoking initiation rates may also have been increasing during this period (O'Loughlin et al. 2014). Despite this, the predictors of tobacco initiation and cessation in young adults remain largely understudied (Freedman et al. 2012). To reduce the health burden of tobacco, it is particularly critical to reduce the pervasiveness of smoking in this age group, since young adults who smoke and persist in smoking throughout the life course risk losing a decade of their life expectancy (Jha and Peto 2014).

Young adults must make important choices related to continuing their education, starting a career, and starting a family (Bachman et al. 2014). This period of transition is

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**Electronic supplementary material** The online version of this article (doi:10.1007/s00038-017-1044-8) contains supplementary material, which is available to authorized users.

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accompanied by changes in the residence, education, and employment that provide new environments, either preventive or conducive to smoking (Furstenberg 2008; Ling and Glantz 2002). Thus, young adulthood is an important life phase during which transitions and life choices are shaping the accumulation of resources that may in turn impact upon young adults' capacity to avoid or cease smoking.

The growing body of literature investigating the determinants of smoking in young adults suggests that cumulative exposure to disadvantage contributes to smoking uptake and maintenance (Chen and Jacques-Tiura 2014; US Department of Health and Human Services 2012). To measure these determinants certain scholars have turned to the work of sociologist Pierre Bourdieu (Bourdieu 1979, 1986) to guide their operationalization of social characteristics and understand how their unequal distribution is associated with health in the population (Abel et al. 2011; Gagné et al. 2015; Veenstra and Abel 2015). Bourdieu's theory explains the creation and maintenance of social inequalities through capital theory. The theory is based on three forms of capital: economic (the financial and material resources that can bring immediate benefit or that can be exchanged against another resource), social (the potential resources that are accessible through the quality and extent of one's social network based on the principles of recognition and reciprocity), and cultural (educational credentials, as well as the skills, knowledge, competencies in addition to the preferences and tastes that are accumulated through socialization in the family and school environments). The term 'capital' specifically implies that access to these resources is distributed unequally through structural processes in the family and formal institutions and these patterns of unequal distribution are reproduced through generations (Savage et al. 2005).

In previous studies theoretically guided by Bourdieu's capital theory, individuals with the most economic, cultural or social resources were hypothesized to be those with the greatest ability to avoid detrimental health behaviors (Abel et al. 2011; Gagné et al. 2015; Schori et al. 2014; Veenstra and Abel 2015). In contrast with previous research, we introduce a form of social capital, proportion of smoking peers. We hypothesize that young adults with a higher proportion of non-smoking social connections (high social capital) will have the best capacity to avoid or cease smoking and conversely young adults with a high proportion of smoking peers (low social capital) will have the least capacity to avoid or cease smoking. Although, this form of social capital has been previously unexplored by studies theoretically guided by Bourdieu's capital theory, we chose to introduce it in our study, as we believe that this capital may be a key determinant of young adults' smoking status due to the prominent role that peer smoking can play

in peer relationships and socializing. The indicator used captured two important elements of Bourdieu's conception of social capital specifically applicable to smoking in young adults. It incorporates the notion of access to resources through the social network, since non-smoking peers can provide young adults with increased social support for cessation by providing information about cessation resources (cessation programs, educational materials, and tricks to cease smoking), and the benefits of quitting or being a non-smoker. They may also promote anti-smoking norms, and may exert pressure on their friends to quit or resist smoking (Curry et al. 2007; Haas and Schaefer 2014). The proportion of smoking peers also incorporates the notion of sociability, since smoking is a social practice that often occurs in a social setting, thus when young adults have few peers to smoke with they may be more likely to cease (Christakis and Fowler 2008) or resist smoking onset.

## Objective

The effect of capital during the transition towards adulthood on smoking uptake and cessation is poorly understood. In our study, we aim to empirically examine the relationship between resources conceptualized as economic, social, and cultural capital at baseline and smoking uptake and cessation using a sample of young adults participating in the Interdisciplinary Study of Inequalities in Smoking study. We hypothesize that high economic, cultural, and social capital will be negatively associated with smoking onset and positively associated with cessation.

## Methods

### Sample

The Interdisciplinary Study of Inequalities in Smoking is a study that was created with the goal of better understanding the interplay of individual and contextual characteristics in the production of social inequalities in smoking among young adults (Frohlich et al. 2015). Recruitment for wave 1 of the study occurred between November 2011 and September 2012, and the second wave of data collection occurred between January and June 2014. Individuals were eligible if they were a non-institutionalized individual, were 18–25 years old at contact, spoke English or French, and had been living at their current address for at least a year. A total of 6020 eligible young adults living within the 35 health service catchment areas (CLSC) of Montreal were randomly selected for participation by the Régie de l'Assurance Maladie du Québec (the publicly funded health insurance program of Quebec, Canada). More information on the sampling procedure used in the study

can be found elsewhere (Frohlich et al. 2015). Participants ( $n = 2093$ ) provided sociodemographic, smoking, and health data by completing a questionnaire using a secured website (90%), using a paper questionnaire (4.2%) or over the phone (5.8%). Participants were compensated with a \$10 gift certificate. Follow-up occurred 2 years later between January and June 2014 ( $n = 1457$ ). We restricted our analysis to participating individuals who had reported their smoking status in both waves of the study.

### Dependent variable

The dependent variable was change in smoking status from wave 1 to wave 2 and was assessed using two questions taken from the Canadian Community Health Survey (Statistics Canada 2014). Participants were first asked: Have you ever smoked a whole cigarette? Those that had smoked a whole cigarette in the past were then asked: currently, do you smoke cigarettes: (1) every day; (2) occasionally; or (3) never? Participants were classified as non-smokers if they had never smoked a whole cigarette or if they did not smoke currently. They were classified as smokers if they had reported smoking every day or occasionally. Based on the participants' responses to these questions at wave 1 and wave 2, participants were categorized as the following: persistent non-smoker (non-smoker in 2012 and 2014), and non-smoker who became a smoker (non-smoker in 2012 and smoker in 2014), smoker who became a non-smoker (smoker in 2012 and non-smoker in 2014) and persistent smoker (smoker in 2012 and 2014).

### Independent variables and covariates

We selected one indicator to represent each capital based on the following criteria: it was an appropriate operationalization of Bourdieu's definition of social, economic or cultural capital, and it was consistent with the literature on the correlates of smoking (O'Loughlin et al. 2014; US Department of Health and Human Services 2012). To measure cultural capital, we used a variable representing highest educational level completed. This variable consisted of three categories: (1) high school or less; (2) CEGEP (postsecondary institution attended after high school, in Quebec, Canada); and (3) university. Income was used to represent economic capital. This was measured using participant's self-reported total personal income before taxes from the previous year (including scholarships, employment insurance benefits, or other insurance benefits). Participants' responses were divided into three categories: (1) \$0 to \$4999; (2) \$5000 to \$19,999; (3) \$20,000 and over. In contrast with previous research using a Bourdieusian framework (Abel et al. 2011; Veenstra and

Abel 2015), we used the proportion of friends that smoke as an indicator of social capital. This was evaluated using the following question: How many of your friends smoke? Possible responses were: (1) none; (2) one or a few; (3) approximately half; (4) most; (5) all. These responses were then re-classified into the categories: (1) none to a few; (2) half; (3) most or all. Baseline sex and age were considered potential covariates in this study as they may correlate with change in smoking status (O'Loughlin et al. 2014). We considered that our main capital indicators of interest might be sensitive to young adult's other social circumstances. Therefore, we included a variable indicating if young adults were employed: (1) not employed, (2) employed part-time, (3) or employed full-time. We also included a variable indicating if they had experienced financial difficulties in the last year (Yes or No) and a variable indicating the number of people that would support the participant in a time of need with the categories: 0–2 people, 3–4 people, 5 or more people.

### Statistical analyses

The sample was stratified according to smoking status at wave 1 to form two separate cohorts "smokers at baseline" and "non-smokers at baseline". Descriptive statistics were carried out to examine the distribution of each variable at baseline and each capital variable according to smoking status. Due to the number of participants that did not report their income at wave 1 ( $n = 135$ ), before conducting the analysis we performed multiple imputation (Enders 2010) using ten imputations, as the data were assumed to be missing at random (MAR). Education at baseline was associated with having missing values for income using chi-square tests (Supplementary material). Sex, age, and the three capital variables were used as predictors for the imputation, as well as other variables we considered might improve the imputation of income. These included a variable indicating if the individual had lacked money to pay for expenses over the course of the last year, employment status, and a variable indicating if the individual would be able to borrow a sum of \$500 from friends and family if an urgent situation were to arise. Logistic regression was run to model the relationship between the three forms of capital at T1 and changes in smoking status controlling for the covariates age and gender at baseline. For each cohort, we first ran separate logistic regression models for each capital with the variables age and sex. We then modeled the relationship including all capital variables in the model at the same time. We also control for employment status, having experienced financial difficulties in the last year, and social network size in the full model. Analyses were performed using SPSS version 22.

## Results

636 people were excluded because they were lost to follow-up at time 2, and, for those who participated at wave 2, 7 people were excluded because they did not report their smoking status. 117 (10.16%) non-smokers and 18 (6.04%) smokers did not report their income. The final sample was comprised of 1450 individuals. At baseline, the average age of participants in the sample was 21.48 (SD: 2.29) most of the sample was female, had completed CEGEP, were earning between \$5000 and \$19,999, and had zero to a few friends that smoked. The sample was comprised of 1075 (74.13%) persistent non-smokers, 77 (5.31%) non-smokers that became smokers, 213 (14.69%) persistent smokers, and 85 (5.86%) smokers that became non-smokers (Table 1).

Tables 2 and 3 present the influence of participants' social characteristics on smoking onset and cessation, respectively. These results reveal that young adults where most or all of their friends smoked had greater odds of smoking onset. Young adults that had completed CEGEP also had higher odds of smoking onset after controlling for social support, employment status, and lacking money to pay for expenses. Income and the demographic variables age and sex were not associated with smoking onset. Table 3 revealed that young adults where half of their friends smoked or where most to all of their friends smoked had lowers odds of smoking cessation. Men were more likely to cease smoking than women. Education, income and age were not associated with cessation.

## Discussion

Previous literature on smoking in young adults suggests that cumulative exposure to detrimental socioeconomic conditions contributes to smoking uptake. We argued that the literature theoretically guided by Bourdieu's capital theory should also consider the proportion of friends that smoke as a form of social capital that can contribute to a young adult's smoking status. We modeled the relationship between economic, cultural, and social capital at baseline and smoking onset and cessation. Social and cultural capital were associated with becoming a smoker, and social capital was associated with cessation.

### Smoking onset

To represent social capital, researchers theoretically guided by Bourdieu's capital theory have tended to use measures of social support from family, friends, and neighbors (Abel et al. 2011) or parents arranging social contacts with people

in influential positions (Veenstra and Abel 2015) and have identified social capital as an important determinant of health. In contrast with these studies, we chose to use the proportion of friends that smoke as an indicator of social capital, as we hypothesized that this indicator would capture important elements of Bourdieu's conception of social capital specifically applicable to smoking in young adults, such as access to resources through the social network and the concept of sociability. Previous empirical findings from the smoking literature have shown that having friends that smoke is associated with being a current smoker (De Clercq et al. 2014; Huang et al. 2014; Kaai et al. 2014; Saari et al. 2014) and becoming a smoker (Chen et al. 2014; Saari et al. 2014). Our results are congruent with these findings; they demonstrate that having a high proportion of friends that smoke is significantly associated with becoming a smoker. Smoking peers may provide ready access to cigarettes for experimental or non-smokers and smoking may play an important social role in the lives of certain young individuals. In certain social contexts such as bars, cafes, and clubs, smoking with friends may promote a sense of social belonging and may contribute to the formation of a shared social identity based on shared practices of consumption (Robilliard 2010).

Bourdieu initially proposed that economic and cultural capital were the two main forms of capital contributing to circumscribing individuals' social position (Bourdieu 1979, 1986). He argued that the main mechanism through which this social position translated into a set of collectively shared practices was through the slow and life-long inculcation of distinctive knowledge, skills, preferences and tastes which, in turn, contribute through distinction to reinforce (or reproduce) one's social position (Abel and Frohlich 2012; Frohlich 2013). In our study, we used income and education to operationalize economic and cultural capital, respectively. Current evidence on the correlates of smoking observes systematic differences in smoking prevalence among young adults according to education and income (Bricard et al. 2016; Corsi et al. 2013; US Department of Health and Human Services 2012). In parallel, previous studies informed by Bourdieu's capital theory have demonstrated that high economic (Abel et al. 2011; Schori et al. 2014; Veenstra and Abel 2015) and cultural capital (Abel et al. 2011; Gagné et al. 2015; Schori et al. 2014; Veenstra and Abel 2015) are associated with the uptake of favorable health behaviors and health outcomes. A few of these studies specifically addressed the influence of economic and cultural capital on smoking in young adults (Gagné et al. 2015; Schori et al. 2014). For instance, Gagné et al. (2015) demonstrated that scoring low in cultural capital dimensions including health values, family resources, and education and knowledge was associated with being a smoker and smoking more cigarettes

**Table 1** Distribution of capital at T1 according to smoking status of young adults from Montreal, Canada, participating in the Interdisciplinary Study of Inequalities in Smoking study (2011–2014)

	Persistent non-smoker ( <i>n</i> = 1075)		Non-smoker who became a smoker ( <i>n</i> = 77)		Persistent smokers ( <i>n</i> = 213)		Smoker who became a non-smoker ( <i>n</i> = 85)		Total ( <i>n</i> = 1450)	
	<i>N</i>	% or mean (SD)	<i>N</i>	% or mean (SD)	<i>N</i>	% or mean (SD)	<i>N</i>	% or mean (SD)	<i>N</i>	% or mean (SD)
Age	1075	21.44 (2.29)	77	21.43 (2.16)	213	21.73 (2.31)	85	21.48 (2.31)	1450	21.48 (2.29)
Gender										
Female	647	60.19	41	53.25	107	50.23	56	65.88	851	58.69
Male	428	39.81	36	46.75	106	49.77	29	34.12	599	41.31
Highest level of education completed										
High school or less	377	35.07	21	27.27	107	50.23	35	41.18	540	37.24
CEGEP <sup>a</sup>	451	41.95	40	51.95	67	31.46	35	41.18	593	40.90
University	246	22.88	15	19.48	38	17.84	15	17.65	314	21.66
Missing	1	0.09	1	1.30	1	0.47	0	0.00	3	0.21
Income		0.00								
\$0–\$4999	331	30.79	19	24.68	44	20.66	19	22.35	413	28.48
\$5000–\$19,999	451	41.95	37	48.05	107	50.23	44	51.76	639	44.07
\$20,000 and over	181	16.84	16	20.78	48	22.54	18	21.18	263	18.14
Missing	112	10.42	3	3.90	14	6.57	4	4.71	133	9.17
Proportion of friends that smoke										
0 to a few	863	80.28	51	66.23	65	30.52	50	58.82	1029	70.97
Half	129	12.00	12	15.58	66	30.99	16	18.82	223	15.38
Most or all	64	5.95	13	16.88	77	36.15	19	22.35	173	11.93
Missing	19	1.77	1	1.30	5	2.35	0	0.00	25	1.72
Social support										
0–2 people	213	19.81	22	28.57	45	21.13	22	25.88	302	20.83
3–4 people	305	28.37	24	31.17	55	25.82	24	28.24	408	28.14
5 or more people	521	48.47	29	37.66	107	50.23	29	34.12	686	47.31
Missing	36	3.35	2	2.60	6	2.82	10	11.76	54	3.72
Financial situation										
Did not lack money to pay for expenses	903	84.00	63	81.82	166	77.93	67	78.82	1199	82.69
Lacked money to pay for expenses	146	13.58	13	16.88	43	20.19	17	20.00	219	15.10
Missing	26	2.42	1	1.30	4	1.88	1	1.18	32	2.21
Employment status										
Not employed	375	34.88	23	29.87	59	27.70	24	28.24	481	33.17
Freelance contract or part-time	488	45.40	36	46.75	107	50.23	43	50.59	674	46.48
Full-time	197	18.33	18	23.38	46	21.60	18	21.18	279	19.24
Missing	15	1.40	0	0.00	1	0.47	0	0.00	16	1.10

<sup>a</sup>Post-secondary institution attended after high school, in Quebec, Canada

daily. Similarly, in our sample, cultural capital was associated with smoking onset. Respondents that had completed CEGEP at baseline had higher odds of becoming a smoker. This suggests that there may not be a simple linear

relationship between cultural capital and smoking, whereby higher cultural capital may not always lead to a decreased risk of smoking. After completing CEGEP many young adults go to university or join the workforce. This period is

**Table 2** Logistic regression model of the effect of cultural, economic, and social capital on young adults from Montreal, Canada, participating in the Interdisciplinary Study of smoking onset (ref. non-smoker at baseline that stayed a non-smoker at T2) for a sample of Inequalities in Smoking study (2011–2014)

	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI					
Gender (ref. female)															
Male	1.355	0.850	2.158	1.334	.838	2.123	1.294	.810	2.068	1.336	0.832	2.145	1.399	0.866	2.258
Age	0.981	0.863	1.115	.948	.838	1.073	.996	.900	1.103	.919	0.793	1.064	0.901	0.777	1.046
Education completed (ref. high school or less)															
CEGEP <sup>a</sup>	1.675	0.931	3.015							1.801	0.994	3.263	1.860*	1.020	3.392
University	1.199	0.520	2.764							1.405	0.603	3.277	1.523	0.650	3.567
Income (ref. \$0 to \$4999)															
\$5000 to \$19,999				1.569	0.854	2.883				1.419	0.766	2.628	1.335	0.695	2.565
\$20,000 and over				1.863	0.823	4.218				1.761	0.779	3.984	1.505	0.603	3.756
Proportion of friends that smoke (ref. none to a few)															
Half							1.493	0.774	2.882	1.443	0.743	2.803	1.399	0.717	2.730
Most or all							3.165*	1.634	6.129	3.329*	1.694	6.542	3.189*	1.616	6.292
Social support (ref. 0–2 people)															
3–4 people													0.790	0.425	1.470
5 or more people													0.563	0.311	1.020
Employment status (ref. not employed)															
Free lance contract, or part-time													1.123	0.628	2.008
Full-time													1.490	0.679	3.268
Financial situation (ref. did not lack money to pay for expenses)															
Lacked money to pay for expenses													1.235	0.640	2.381

\* $p < 0.05$

<sup>a</sup>Post-secondary institution attended after high school, in Quebec, Canada

**Table 3** Logistic regression model of the effect of cultural, economic, and social capital on adults from Montreal, Canada, participating in the Interdisciplinary Study of Inequalities in smoking cessation (ref. smoker at baseline that stayed a smoker at T2) for a sample of young Smoking study (2011–2014)

	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Gender (ref. female)										
Male	0.554*	0.422 0.726	0.517*	0.306 0.875	0.506*	0.294 0.871	0.526*	0.304 0.911	0.526*	0.301 0.918
Age	0.910	0.795 1.040	0.943	0.825 1.077	0.939	0.836 1.053	0.903	0.767 1.064	0.883	0.745 1.046
Education completed (ref. high school or less)										
CEGEP <sup>a</sup>	1.703	0.924 3.139						0.764	2.835	0.812 3.135
University	1.521	0.649 3.563						0.528	3.243	0.555 3.493
Income (ref. \$0–\$4999)										
\$5000 to \$19,999			1.064	0.532 2.125				0.510	2.158	1.076 0.517 2.239
\$20,000 and over			1.132	.456 2.807				0.422	2.860	1.122 0.400 3.144
Proportion of friends that smoke (ref. none to a few)										
Half					0.309*	0.158 0.605	0.307*	0.156 0.604	0.286*	0.144 0.569
Most or all					0.311*	0.165 0.586	0.338*	0.176 0.648	0.334*	0.160 0.608
Social support (ref. 0–2 people)										
3–4 people									1.802	0.788 4.119
5 or more people									1.264	0.607 2.632
Employment status (ref. not employed)										
Free lance contract, or part-time									0.776	0.407 1.479
Full-time									0.936	0.388 2.259
Financial situation (ref. did not lack money to pay for expenses)										
Lacked money to pay for expenses									1.239	0.611 2.511

\**p* < 0.05

<sup>a</sup>Post-secondary institution attended after high school, in Quebec, Canada

characterized by decreased parental control and may lead to a transition into school or workplace settings that are conducive to smoking making young adults particularly susceptible to smoking onset (Gagné and Veenstra 2017; Hammond 2005; Ling and Glantz 2002; O'Loughlin et al. 2014).

### Smoking cessation

Previous studies have shown that low income or poor educational attainment is associated with a lower likelihood of successful cessation in young adults (Bowes et al. 2015; Corsi et al. 2013). In contrast, education and income were not significantly associated with cessation in our sample. However, our results indicated that young adults who reported that half or more of their friends smoked had lower odds of cessation. Similarly, in a systematic review, five out of seven longitudinal studies that examined peer smoking as a predictor of cessation found that having no friends that smoke is positively associated with cessation (Cengelli et al. 2011). Our findings, support our original hypothesis, that having a high proportion of non-smoking peers can facilitate cessation, as non-smoking peers could be providing young adults with information about cessation resources (cessation programs, educational materials, and tricks to cease smoking), the benefits of quitting or being a non-smoker and may also be promoting anti-smoking norms (Curry et al. 2007; Haas and Schaefer 2014).

### Limitations

We can't make any causal claims regarding the association between social characteristics and smoking. Due to our sample size, we were precluded from using several indicators per capital to capture the multidimensional nature of each capital, and to obtain a more precise estimate of their distributions. Finally, using income as an indicator of economic capital has its limitations, as many of the study participants were students and may have still been dependent on their parents' economic resources.

### Conclusion

This study filled an important gap in the literature by examining whether social characteristics during young adulthood may be of consequence for smoking initiation and cessation in young adults. We used a Bourdieusian framework to operationalize young adults' social characteristics through education, income, and peer smoking and their association with becoming a smoker and ceasing to smoke. We found that social and cultural capital influenced young adults' risk of smoking onset but that economic

capital had no significant effect on smoking initiation. Social capital was also associated with cessation. Our results imply that interventions focusing on peer smoking may present promising avenues for tobacco prevention in young adults.

**Acknowledgements** We would like to thank the team members for giving feedback on a rough draft of the manuscript. We would also like to thank the study participants. MSW and TG are funded by doctoral grants from the *Fonds de Recherche du Québec-Santé* (FRQS). This work was supported by the CIHR operating Grant #DCO150GP to KLF.

### Compliance with ethical standards

**Ethics approval** This article does not contain any studies with animals performed by any of the authors. The study was approved by the research Ethics Committee of the Université de Montréal's Faculty of Medicine (11-019-CERFM-D).

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