Taylor & Francis
Taylor & Francis Group

Predicting smoking behavior: intention and future self-continuity among Austrians

Xiang Zhao , Franziska F. Dichtl & Heather M. Foran

Published online: 04 Nov 2020.

Submit your article to this journal ⧉

Article views: 250

View related articles ⧉

View Crossmark data ⧉

Taylor & Francis
Taylor & Francis Group

Predicting smoking behavior: intention and future self-continuity among Austrians

Xiang Zhao, Franziska F. Dichtl and Heather M. Foran

Institute of Psychology, University of Klagenfurt, Klagenfurt am Wörthersee, Austria

ABSTRACT

Smoking is a major public health problem in Austria, but relevant research and intervention is limited. Based on the Theory of Planned Behavior (TPB), the present study aimed to test the model utility in an Austrian sample. As future self-continuity is likely to impact on health behavior, we also hypothesized an extended TPB with future self-continuity could further explain the variance in smoking. Using a prospective design, 94 current smokers (74.5% women; M_{age} = 24.27 years; 61.7% daily smokers) from a university in South Austria completed the baseline and follow-up survey (one month after the baseline). Consistent with the TPB, intention and perceived behavioral control (PBC) significantly predicted smoking behavior; affective attitude and PBC were significantly associated with smoking intention. In contrast, cognitive attitude and subjective norm were unrelated to smoking intention. As hypothesized, the TPB explained 42% variance of smoking behavior and 31% variance of smoking intention. Participants' future self-continuity further explained the variance of smoking behavior. Our study demonstrates the utility of the TPB in understanding Austrian smoking behavior. The role of psychological perception of future self among smokers has been highlighted. Future smoking intervention may target PBC, affective attitude, as well as a life-span perspective.

Introduction

Smoking remains the leading risk factor for early death in Europe (GBD 2015DALYs & HALE Collaborators, 2016; World Health Organization, 2009). A survey across 27 European countries found that Austria has a relatively high smoking prevalence (33%), large amount of daily cigarette consumption (18.3 units), as well as a wide diversity of using tobacco products (TNS Opinion & Social, 2012). Compared with other European countries, Austrian smokers are most attracted by sensual pleasures of cigarette products (e.g., packaging, taste), and most reluctant to stop smoking unless advice is given by health professionals or a smoking ban is stipulated (TNS Opinion & Social, 2012). While tobacco use has contributed to disease burden for Austria (Celermajer & Nasir-Ahmad, 2017), there is little research on smoking among Austrians.

CONTACT Xiang Zhao xiang.zhao@outlook.com Institute of Psychology, University of Klagenfurt, Universitätsstraße 65-67, Klagenfurt am Wörthersee 9020, Austria

Investigation to identify psychological risk factors of smoking is important for understanding Austrian smoking. The Theory of Planned Behavior (TPB; Ajzen, 1991) is a well-established model used in health psychology. According to the TPB, smoking behavior is determined by intention (i.e., one's readiness to smoke) and perceived behavioral control (PBC; i.e., perceptions of one's ability to smoke); intention, in turn, is influenced by attitude (i.e., one's evaluation of smoking), subjective norm (i.e., one's perceived social pressure to smoke), and PBC. The TPB has been previously applied for smoking research (e.g., Armitage & Conner, 2001; Tseng et al., 2018; Zhao et al., 2018) as well as antismoking intervention (e.g., Steinmetz et al., 2016; Zhao et al., 2019b) across multiple countries. While PBC is a salient predictor for smoking intention in the West (e.g., Harakeh et al., 2004), subjective norm plays a critical role among Asian smokers (e.g., Lee et al., 2006; Zhao et al., 2019). Nonetheless, TPB-based smoking studies have not been undertaken in Austria.

While the utility of the TPB has been recognized, previous research also indicated a portion of unexplained variance in behavior. One popular remedy is to extend the TPB with plausible constructs (e.g., Zhao et al., 2019). In this study, we extended the TPB with future self-continuity (FSC) which refers to one's perceived persistence of selfhood from the present to the future (Ersner-Hershfield et al., 2009). Theories in health psychology are suggested to consider the dimension of time such as future (Scholz, 2019). It has been found that people who are unable to better visualize their future are more likely to perform risky behaviors (e.g., delinquent behaviors; Van Gelder et al., 2013). However, incorporating future self-continuity into health research is of growing interest. One recent study found that stronger psychological connectedness one feels with their future selves is related to better health outcomes (Rutchick et al., 2018). As such, smokers who perceive themselves similar or connected to their future selves may be more concerned about the accumulating effect of smoking over time. To investigate this speculation, we thus hypothesized that smokers who perceived stronger future self-continuity would perform less smoking behavior as they would associate the isolated health actions today to a long-term consequence.

In summary, the current work examined the utility of the TPB among Austrian smokers. We also hypothesized future self-continuity could further explain the variance in smoking behavior. As previous health research using future self-continuity mainly utilized univariate analyses, potentially ignoring important decision-making constructs such as intention and self-efficacy, this study could theoretically elucidate the role of one's perception of self-continuity. Findings from this study would also provide implications for antismoking education and intervention in Austria.

Methods

Participants and procedure

A prospective design with two time points was utilized. Participants were recruited via an Austrian university's social media (e.g., email server). Students who were over 18 years and were current smokers were eligible. We defined current smokers as those who smoked in the past 30 days. To compensate participants' time, participants could choose one of the three types of incentives (i.e., 30 minutes for a course on research methods,

partaking in the draw for a 25 Euro Amazon voucher, one bonus point for a lecture exam). Participants were informed with the study and the voluntary and anonymous nature of their participation at Time 1. Information was provided via an online system after the consent had been confirmed. With the email addresses provided, a follow-up email was sent one month later with the link for Time 2 survey. Based on our prior sample size calculation, to achieve an anticipated effect size (f^2) of .20 (power = .80; α = .05), 91 participants were needed for a multiple regression with ten predictors. Although there were 273 participants at Time 1, a substantial attrition (65.6%) was identified (reasons included no participation at Time 2, unmatched ID codes). As a result, 94 cases with complete data at both Time 1 and 2 were obtained. This study was conducted in 2019 Winter and was approved by University's Ethics Committee.

Measures

Constructs based on the TPB were developed following the guidelines by Ajzen (1991) as well as previous smoking studies (e.g., Zhao et al., 2019b) that accessed TPB constructs. As per the Target Action Context Time (TACT; Fishbein & Ajzen, 2010) principle, all the questions reminded participants to think about smoking during the following month. The questionnaire was developed in English and then translated and implemented in German. Bilingual members in the research team conducted wording checking and revision. All scales showed satisfactory psychometric properties (for details, see Table 2).

Smoking behavior at Time 2 was the main outcome variable. We used a single item to measure participants' smoking frequency in the past month (from [1] *never* to [7] *very frequently*).

Smoking intention was assessed using three items (e.g., *I intend to smoke*; α = .80) with a 7-point Likert scale (from [1] *strongly disagree* to [7] *strongly agree*).

Attitude was measured with five 7-point semantic items including two subscales. Both *Affective attitude* (e.g., [1] *unpleasant* to [7] *pleasant*; ρ = .24, p = .021) and cognitive attitude (e.g., [1] *unhealthy* to [7] *healthy*; α = .80) showed a good internal consistency.

Subjective norm was assessed with three items (e.g., *Those people who are important to me would want me to smoke*; α = .70) on a 7-point Likert scale (from [1] *strongly disagree* to [7] *strongly agree*).

Perceived behavioral control. Following the suggestions by Ajzen (2002), two subscales were used. Both *controllability* (e.g., *It is mostly up to me whether I smoke*; ρ = .32, p = .002) and *self-efficacy* (e.g., *I am confident that I could smoke*; ρ = .65, p < .001) were measured using a 7-point Likert scale (from [1] *strongly disagree* to [7] *strongly agree*).

Future self-continuity. Using the measures developed by Ersner-Hershfield et al. (2009), four questions were utilized to access how similar and connected participants feel between their current self and the self in 10 years. In addition, we also measured how much participants cared and liked their future selves. All questions were measured using a 7-point visual scale with higher scores indicating higher levels of similarity, connectedness, care, and like. As this scale showed an unacceptable property (α = .53; Nunnally (1978)), four items were treated separately as individual dimensions in the subsequent analyses.

Table 1. Participants' demographic and smoking background (N = 94).

Variable	N (%)
Gender	
Women	70 (74.5%)
Men	21 (22.3%)
Other	3 (3.2%)
Average age (SD) – years	24.27 (4.40)
Had ever smoked at least 100 cigarettes	92 (97.9%)
Smoking frequency	
Some days	36 (38.3%)
Every day	58 (61.7%)
Type of tobacco tried	
Cigarettes	94 (100%)
Shisha or hookah	76 (80.9%)
E-cigarettes or vaporizers	54 (57.4%)
Other products	20 (21.3%)
Pipe	14 (14.9%)
Betel nut	0

Table 2. Descriptive summary of study variables and their correlations with smoking behavior and intention.

Variable	Scalability	M (SD)	Smoking behavior (Time 2)	Smoking intention
Smoking behavior (Time 2)	-	4.17 (1.76)	-	.64***
Smoking intention	α =.80	5.14 (1.65)	.64***	-
Cognitive attitude	α =.80	1.34 (.58)	−.22*	−.11
Affective attitude	ρ =.24*	3.94 (1.21)	.29**	.35**
Subjective norm	α =.70	1.68 (.98)	−.02	−.01
Controllability	ρ =.32**	5.13 (1.44)	−.27**	−.19
Self-efficacy	ρ =.65***	5.76 (1.37)	.15	.38***
FSC similar	-	4.31 (1.18)	.21*	.18
FSC connected	-	4.40 (1.75)	−.07	.03
FSC care	-	5.70 (1.45)	−.01	−.10
FSC like	-	6.00 (1.32)	.01	.10
Age (year)	-	24.27 (4.40)	.03	−.14
Gender	-	-	−.22*	−.06

Note. FSC = future self-continuity. All variables were assessed at Time 1 except for smoking behavior which was assessed at Time 2 (i.e., 4 weeks after Time 1). Scalability was evaluated using Cronbach's α for measures with at least 3 items. For affective attitude, controllability, and self-efficacy, the Spearman's ρ index was used because these constructs include two items. Single-item scales' scalability was not assessed. Gender: Men = 1, Women = 0. For full correlation matrix, see Appendix. * p <.05. ** p <.01. *** p <.001.

Demographic variables included gender and age. *Smoking experience* was assessed using three questions on ever smoking experience, smoking frequency, and tobacco type (Attarabeen et al., 2019). Table 1 summarizes the scales used for these variables.

Results

Descriptive findings

Among the 94 current smokers, approximately three quarters were women, with a wide range of ages (ranging from 18 to 38 years; M_{age} = 24.27). While all participants had experience of smoking factory-made cigarettes, they also reported experience with other types of tobacco except for betel nut (see Table 1). This diversity in tobacco use may explain why there were

two participants who had not smoked 100 cigarettes. Moreover, the majority (61.7%) were daily smokers.

Inter-variable correlations are summarized in Table 2 and Supplemental Table. Smoking behavior at Time 2 was significantly associated with intention, cognitive attitude, affective attitude, controllability, similarity between current and future self, and gender, whereas smoking intention was only related to affective attitude, self-efficacy. Notably, subjective norm showed weak correlations with TPB constructs except for attitude. Compared with women, men tended to regard smoking asless harmful.

Regression to predict smoking behavior in one month

As shown in Table 3, intention was constantly the strongest predictor of smoking behavior. Controllability also showed a weak but significant link with participants' future smoking. In the typical TPB framework (Block 1), the variables explained 42% of the variance in smoking behavior. When FSC variables were added, the change in coefficient of determination (ΔR^2) was nonsignificant, $F_{(4,83)} = 2.01$, $p = .100$. However, when gender was further added (Block 3), the model showed a significant improvement, such that women reported higher frequencies of smoking, $F_{(1,82)} = 5.28$, $p = .024$. In the final model (Block 3), in addition to smoking intention, participants' perception on how similar and connected they felt between their current self and future self both significantly predicted their smoking behavior at Time 2. Interestingly, these two dimensions (i.e., similar and connected) showed different predicting directions with smoking.

Table 3. Regression of smoking behavior at one-month follow-up.

	β	95% CI	sr^2	R^2 (adj. R^2)	ΔR^2
Block 1				.42 (.40)	-
Controllability	−.17†	[−.43,.00]	.04		
Self-efficacy	−.05	[−.30,.16]	.00		
Smoking intention	.61***	[.46,.85]	.34		
Block 2				.48 (.43)	.06
Controllability	−.18*	[−.44, −.02]	.05		
Self-efficacy	−.04	[−.29,.18]	.00		
Smoking intention	.60***	[.44,.84]	.33		
FSC similar	.21*	[.02,.60]	.05		
FSC connected	−.24*	[−.45, −.04]	.07		
FSC care	.13	[−.07,.38]	.02		
FSC like	−.03	[−.26,.18]	.00		
Block 3				.51 (.46)	.03*
Controllability	−.15	[−.40,.02]	.04		
Self-efficacy	−.06	[−.30,.15]	.01		
Smoking intention	.60***	[.45,.84]	.34		
FSC similar	.22*	[.04,.60]	.06		
FSC connected	−.23*	[−.43, −.03]	.06		
FSC care	.16	[−.03,.41]	.04		
FSC like	−.06	[−.30,.14]	.01		
Gender (male)	−.19*	[−1.46, −.11]	.06		

Note. FSC = future self-continuity. β = standardized coefficients. sr^2 = squared semi-partial correlations. adj. = adjusted. † $p =.05$. * $p <.05$. *** $p <.001$.

Table 4. Regression results of smoking intention.

	β	95% CI	sr^2	R^2 (adj. R^2)	ΔR^2
Block 1				.31 (.27)	-
Cognitive attitude	−.09	[−.83,.28]	.01		
Affective attitude	.36***	[.22,.74]	.13		
Subjective norm	−.05	[−.39,.23]	.00		
Controllability	−.30**	[−.57, −.13]	.11		
Self-efficacy	.33**	[.16,.61]	.12		
Block 2				.37 (.30)	.07
Cognitive attitude	−.10	[−.85,.29]	.01		
Affective attitude	.34**	[.18,.71]	.12		
Subjective norm	−.03	[−.36,.26]	.00		
Controllability	−.30**	[−.57, −.14]	.12		
Self-efficacy	.34**	[.18,.62]	.14		
FSC similar	.20	[−.02,.57]	.04		
FSC connected	.06	[−.16,.27]	.00		
FSC care	−.17	[−.42,.03]	.03		
FSC like	.10	[−.12,.35]	.01		
Block 3				.37 (.29)	.00
Cognitive attitude	−.09	[−.85,.31]	.01		
Affective attitude	.34**	[.19,.72]	.12		
Subjective norm	−.03	[−.36,.27]	.00		
Controllability	−.30**	[−.57, −.13]	.11		
Self-efficacy	.33**	[.17,.62]	.13		
FSC similar	.20	[−.02,.57]	.04		
FSC connected	.06	[−.16,.27]	.00		
FSC care	−.17	[−.42,.04]	.03		
FSC like	.09	[−.12,.35]	.01		
Gender (male)	−.03	[−.86,.65]	.00		

Note. FSC = future self-continuity. β = standardized coefficients. sr^2 = squared semi-partial correlations. adj. = adjusted. ** p <.01. *** p <.001.

Regression analysis for smoking intention

Regression analyses with three blocks were undertaken sequentially (Table 4). The change in coefficient of determination (ΔR^2) was nonsignificant for both Block 2 ($F_{(4,81)}$ = 1.90, p = .118) and Block 3 ($F_{(1,80)}$ = .07, p = .787). Across all models, affective attitude, controllability, and self-efficacy showed significant associations with smoking intention. While affective attitude and self-efficacy had a positive direction, controllability showed a negative direction. Following the standard TPB, constructs in Block 1 explained 31% of the variance in smoking intention. Unlike models in Table 3, additional variables from FSC did not show any significant associations.

Discussion

To authors' knowledge, this is the first TPB-based smoking study in Austria. Our findings suggest the utility of the TPB in examining smoking in Austria as the model accounted for 42% variance in smoking behavior; 31% of the variance in smoking intention was explained by attitude, subjective norm and PBC. The R^2 for intention is slightly smaller than the averaged figure reported in meta-analysis based on previous TPB-research (Armitage & Conner, 2001). The roles of PBC and affective attitude have been highlighted. In the extended TPB framework, novel findings regarding future self-continuity were also identified, indicating the overlooked relationship between one's perceived identities across time and their smoking behavior. As a country with alarming and under-

researched smoking status, our study provides important implications for future tobacco research and tobacco control.

Smokers in our study showed consistent tobacco use patterns with previous research (TNS Opinion & Social, 2012). While factory-made cigarette was used by all, participants also reported their experience with other tobacco products. Some smokers may use non-cigarette as their main tobacco type as there were two participants had smoked less than 100 cigarettes. Whereas PBC constantly showed associations with smoking behavior and intention, subjective norm showed very little relation. A sharp contrast is found in TPB-based smoking research from China where subjective norm is the strongest predictor for smoking intention (Zhao et al., 2019) and the most difficult construct to be changed in intervention (Zhao et al., 2019b). While cross-national surveys are needed to unpack this interesting perceptual difference between these two countries with high smoking prevalence, this contrast suggests that individual-focused intervention may work better among Austrian smokers. Another notable construct is attitude. While cognitive attitude showed nonsignificant relationship with smoking intention, affective attitude is significant. Consistent with a previous cross-national survey (TNS Opinion & Social, 2012), this finding suggests risk-associated attitude may be unrelated to people's smoking and smoking could be promoted if the sensual perceptions (e.g., flavor, taste) are satisfied. Given the importance of affective attitude, smoking research in Austria may further investigate flavored tobacco products which have been identified as a popular type of tobacco use in other Central European countries such as Slovenia (Koprivnikar & Zupanic, 2017).

As hypothesized, future self-continuity explained another 6% variance in smoking behavior. However, among four dimensions, only the similarity and connectivity showed significant effects for smoking. Paradoxically, although the similarity and connectivity are correlated at an inter-item perspective, they showed opposite predicting directions with smoking. We believe the connectivity dimension is closer to our hypothesis if semantic meanings between items are considered. Connectivity emphasizes on the consequences from the present to the future. As hypothesized, one who feels a stronger connection between smoking behavior now to their future self would smoke less because the consequence seems clearer to them. As for the similarity, smoker identity itself may be an integral part of selfhood as research identified some turning points exist when nonsmokers become smokers (Davey & Zhao, 2020). Likewise, as smoking is regarded as a rite of passage, research also found that even some nonsmoker adolescents constantly reported their intention to smoke when they become 20–25 years old (Zhao et al., 2019a). Thus, to imagine a future self that is similar to the present self could also relate to a future self with similar smoking demeanors to one's current status. Consistent with a measurement study by Sokol and Serper (2020), our findings question the scale property of the four-item future self-continuity especially for those health behaviors with rich social meanings (Mielewczyk & Willig, 2007).

Our findings provide insights for future smoking education and intervention in Austria. Consistent with the experience in the US (Botvin & Griffin, 2007), information about harm of smoking is unlikely to alter smokers' intention as the cognitive attitude is unrelated to smoking intention. Raising an antismoking norm in wider society may fail to reduce smoking due to the nonsignificant subjective norm. By contrast, the salient roles of PBC and affective attitude suggest activities that reinforce smokers' self-

efficacy (e.g., refusal skills training) and positivity of smoking (e.g., deconstructing the positive smoking-associated images portrayed by media) may result in fruitful outcomes. While few smoking cessation programs applied selfhood management, our results also indicate that a lifespan perspective considering transitions in life may help smokers to better understand the consequences of smoking (Shanahan, 2000). Future studies eliciting Austrian smokers' control beliefs are needed so that specific program activities can be developed.

The sample in our study is limited to an urban area in South Austria, and is largely composed of smoker women. Our sample is also largely composed of university students whose smoking career (e.g., years of smoking, underlying smoking-associated diseases) is unknown. Thus, further studies targeting other Austrian regions with more vocational diversities are needed for generalizations. There were 21.3% of participants reported the use of other tobacco products without specifying; future research could elucidate the types of tobacco products used in South Austria. Nevertheless, as the first TPB-based smoking investigation in Austria, our study tested the utility of the TPB and provides important findings for future research. Findings from this study suggest smoking cessation programs may work well if targeting PBC, selfhood management, and affective attitude.

Disclosure statement

ORCID

Xiang Zhao 🔟 http://orcid.org/0000-0003-1054-9462
Franziska F. Dichtl 🔟 http://orcid.org/0000-0003-3264-2940
Heather M. Foran 🔟 http://orcid.org/0000-0001-6659-5500

References

Ajzen, I. (1991). The Theory of Planned Behavior. *Organizational Behavior and Human Decision Processes*, *50*(2), 179–211. https://doi.org/10.1016/0749-5978(91)90020-T

Ajzen, I. (2002). Perceived behavioral control, self-efficacy, locus of control, and the Theory of Planned Behavior. *Journal of Applied Social Psychology*, *32*(4), 665–683. https://doi.org/10.1111/j.1559-1816.2002.tb00236.x

Armitage, C. J., & Conner, M. (2001). Efficacy of the Theory of Planned Behaviour: A meta-analytic review. *British Journal of Social Psychology*, *40*(4), 471–499. https://doi.org/10.1348/014466601164939

Attarabeen, O., Alkhateeb, F., Larkin, K., Sambamoorthi, U., Newton, M., & Kelly, K. (2019). Tobacco use among adult Muslims in the United States. *Substance Use & Misuse*, *54*(8), 1385–1399. https://doi.org/10.1080/10826084.2019.1581223

Botvin, G. J., & Griffin, K. W. (2007). School-based programmes to prevent alcohol, tobacco and other drug use. *International Review of Psychiatry*, *19*(6), 607–615. https://doi.org/10.1080/09540260701797753

Celermajer, D., & Nasir-Ahmad, S. (2017). Cigarette smoking in Austria – A call for action. *Wiener klinische Wochenschrift*, *129*(23), 864–865. https://doi.org/10.1007/s00508-017-1254-3

Davey, G., & Zhao, X. (2020). Turning points to becoming a tobacco smoker: Smoking initiation and identity change among Chinese youth. *Symbolic Interaction*, *43*(2), 308–331. https://doi.org/10.1002/symb.442

Ersner-Hershfield, H., Garton, M. T., Ballard, K., Samanez-Larkin, G. R., & Knutson, B. (2009). Don't stop thinking about tomorrow: Individual differences in future self-continuity account for saving. *Judgment and Decision Making*, *4*(4), 280–286.

Fishbein, M., & Ajzen, I. (2010). *Predicting and changing behavior: The reasoned action approach*. Psychology Press.

GBD 2015 DALYs, & HALE Collaborators. (2016). Global, regional, and national disability-adjusted life-years (DALYs) for 315 diseases and injuries and healthy life expectancy (HALE), 1990-2015: A systematic analysis for the global burden of disease study 2015. *The Lancet*, *388*(10053), 1603–1658. https://doi.org/10.1016/S0140-6736(16)31460-X

Harakeh, Z., Scholte, R. H. J., Vermulst, A. A., de Vries, H., & Engels, R. C. M. E. (2004). Parental factors and adolescents' smoking behavior: An extension of The Theory of Planned Behavior. *Preventive Medicine*, *39*(5), 951–961. https://doi.org/10.1016/j.ypmed.2004.03.036

Koprivnikar, H., & Zupanic, T. (2017). The use of different tobacco and related products, with and without flavours, among 15-year-olds in Slovenia. *Slovenian Journal of Public Health*, *56*(2), 74–81. https://doi.org/10.1515/sjph-2017-0010

Lee, H.-R., Ebesu Hubbard, A. S., O'Riordan, C. K., & Kim, M.-S. (2006). Incorporating culture into the Theory of Planned Behavior: Predicting smoking cessation intentions among college students. *Asian Journal of Communication*, *16*(3), 315–332. https://doi.org/10.1080/01292980600857880

Mielewczyk, F., & Willig, C. (2007). Old clothes and an older look: The case for a radical makeover in health behaviour research. *Theory & Psychology*, *17*(6), 811–837. https://doi.org/10.1177/0959354307083496

Nunnally, J. C. (1978). *Psychometric theory* (2nd ed.). McGraw-Hill.

Rutchick, A. M., Slepian, M. L., Reyes, M. O., Pleskus, L. N., & Hershfield, H. E. (2018). Future self-continuity is associated with improved health and increases exercise behavior. *Journal of Experimental Psychology: Applied*, *24*(1), 72–80. https://doi.org/10.1037/xap0000153

Scholz, U. (2019). It's time to think about time in health psychology. *Applied Psychology: Health and Well-Being*, *11*(2), 173–186. https://doi.org/10.1111/aphw.12156

Shanahan, M. J. (2000). Pathways to adulthood in changing societies: Variability and mechanisms in life course perspective. *Annual Review of Sociology*, *26*(1), 667–692. https://doi.org/10.1146/annurev.soc.26.1.667

Sokol, Y., & Serper, M. (2020). Development and validation of a future self-continuity questionnaire: A preliminary report. *Journal of Personality Assessment*, *102*(5), 677–688. https://doi.org/10.1080/00223891.2019.1611588

Steinmetz, H., Knappstein, M., Ajzen, I., Schmidt, P., & Kabst, R. (2016). How effective are behavior change interventions based on the Theory of Planned Behavior? *Zeitschrift für Psychologie*, *224*(3), 216–233. https://doi.org/10.1027/2151-2604/a000255

TNS Opinion & Social. (2012) . *Special Eurobarometer 385: Attitudes of Europeans towards tobacco*. European Commission.

Tseng, Y.-F., Wang, K.-L., Lin, C.-Y., Lin, Y.-T., Pan, H.-C., & Chang, C.-J. (2018). Predictors of smoking cessation in Taiwan: Using the Theory of Planned Behavior. *Psychology, Health & Medicine*, *23*(3), 270–276. https://doi.org/10.1080/13548506.2017.1378820

Van Gelder, J.-L., Hershfield, H. E., & Nordgren, L. F. (2013). Vividness of the future self predicts delinquency. *Psychological Science*, *24*(6), 974–980. https://doi.org/10.1177/0956797612465197

World Health Organization. (2009) . *Global health risks: Mortality and burden of disease attributable to selected major risks*.

Zhao, X., Davey, G., & Wan, X. (2019). Mindfulness, smoking intention, and nicotine dependence among Buddhist ethnic minority adolescents in China. *Journal of Child & Adolescent Substance Abuse*, *28*(3), 210–220. https://doi.org/10.1080/1067828X.2019.1680469

Zhao, X., White, K. M., & Young, R. M. (2019a). Future smoking intentions at critical ages among students in two Chinese high schools. *International Journal of Behavioral Medicine*, *26*(1), 91–97. https://doi.org/10.1007/s12529-018-09759-y

Zhao, X., White, K. M., & Young, R. M. (2019b). A TPB-based smoking intervention among Chinese high school students. *Substance Use & Misuse*, *54*(3), 459–472. https://doi.org/10.1080/10826084.2018.1508298

Zhao, X., White, K. M., Young, R. M., & Obst, P. L. (2018). Smoking beliefs among Chinese secondary school students: A theory-based qualitative study. *Nicotine & Tobacco Research*, *20* (3), 321–331. https://doi.org/10.1093/ntr/ntx012