Addictive Behaviors 39 (2014) 1337–1341

Contents lists available at ScienceDirect

Addictive Behaviors

Characteristics of adolescent intermittent and daily smokers ☆

Mark L. Rubinstein [a,*], Michelle A. Rait [a], Saunak Sen [b], Saul Shiffman [c]

[a] Division of Adolescent Medicine, University of California, San Francisco, San Francisco, CA, United States
[b] Division of Biostatistics, University of California, San Francisco, United States
[c] Department of Psychology, University of Pittsburgh, Pittsburgh, PA, United States

HIGHLIGHTS

- Despite infrequent smoking, most adolescent ITS reported signs of addiction.
- Adolescent ITS report similar difficulty in quitting smoking as daily smokers.
- Given the risks, we must develop a greater understanding of adolescent ITS.

ARTICLE INFO

Available online 5 May 2014

Keywords:
Adolescent nicotine addiction
Adolescent smoking
Intermittent smokers
Daily smokers
Light smoking

ABSTRACT

Introduction: Intermittent smoking is common among adolescent smokers, but little is known about adolescent intermittent smokers (ITS). This study describes a cohort of adolescent ITS and compares them to adolescent daily smokers (DS) for the purpose of providing a more detailed characterization of adolescent ITS, specifically patterns of smoking, level of self-reported addiction, and experience with cessation
Methods: Participants were 124 ITS and 55 DS. ITS were defined as smoking at least monthly but <30 days per month; and DS as smoking daily. Participants completed demographic, smoking and addiction surveys including the HONC and mFTQ.
Results: ITS started smoking at an older age, smoked fewer cigarettes per day and scored significantly lower on addiction scales, but had similar difficulty to DS in quitting smoking with similar numbers of reported quit attempts. These differences remained after adjusting for years of smoking. ITS were more likely to smoke in social situations, while DS were more likely to smoke when angry. Both groups were equally likely to report smoking when drinking alcohol.
Conclusions: We documented significant differences in smoking related behaviors between adolescent ITS and DS. Importantly, we also found that, despite low level infrequent smoking, ITS reported difficulty in quitting smoking. Given the risks from light and intermittent smoking, it is essential that we develop a greater understanding of adolescent ITS, including their difficulty in quitting and the contextual factors influencing their smoking, so that we may develop new targeted interventions.

1. Introduction

Cigarette smoking is most frequently initiated during adolescence (Services, U. S. D. o. H. a. H., 2012). The transition from experimentation with cigarettes to daily or "addicted" smoking is variable but often encompasses a period of non-daily (i.e., intermittent) smoking (Kandel & Chen, 2000). The development of addiction in adolescence remains controversial, with some researchers arguing that addictive smoking is differentiated from experimental or intermittent smoking by the presence of *daily smoking* (Colby, Tiffany, Shiffman, & Niaura, 2000). Others argue that adolescents can become addicted to nicotine even before they begin smoking daily (DiFranza et al., 2011; O'Loughlin et al., 2003). Further complicating the understanding of addiction are findings that, at least among adults, many intermittent smokers (ITS) can go days at a time without smoking (Shiffman et al., 2012), and yet experience great difficulty in quitting smoking, with quit rates similar to those of daily smokers (Tindle & Shiffman, 2011). In fact, this pattern of persistent, intermittent smoking challenges some of the established notions of addiction whereby addicted smokers must smoke throughout the day in order to prevent withdrawal (Benowitz, 2010).

Abbreviations: CPD, cigarettes per day; ITS, intermittent smokers; DS, daily smokers; mFTQ, Modified Fagerström Tolerance Questionnaire; HONC, Hooked on Nicotine Checklist.

☆ The work was performed at the University of California, San Francisco, San Francisco, CA.

* Corresponding author at: University of California, San Francisco, 3333 California Street, Suite 245, San Francisco, CA 94118, United States. Tel.: +1 415 476 5763; fax: +1 415 476 6106.
E-mail address: rubinsteinm@peds.ucsf.edu (M.L. Rubinstein).

http://dx.doi.org/10.1016/j.addbeh.2014.04.021
0306-4603/

There is a growing literature on the prevalence and significance of ITS in young adult and adult smokers. For a review see Husten, (2009). However, despite the known health-risks posed by intermittent smoking (Schane, Ling, & Glantz, 2010), and the fact *most* adolescent smokers are non-daily smokers (Centers for Disease Control, Prevention, 2013), there is scant research on adolescent ITS. Although it is possible that adolescent ITS may be on a developmental trajectory that will eventually lead to daily smoking, we know from the young adult literature that many ITS smokers will continue to smoke intermittently (Levy, Biener, & Rigotti, 2009). Furthermore, even if some of this group will eventually transition to daily smoking, understanding the current smoking patterns and habits of ITS is important because characterizing their level of addiction, ability to quit, and factors influencing their smoking behaviors can prove useful for the development of prevention and treatment programs specifically targeted towards this important group of adolescent smokers. For example, many cessation programs utilize a paradigm of daily smoking when addressing withdrawal symptoms and craving, an approach which may not be relevant to ITS. In addition, nicotine replacement, a common adjunct for cessation treatment is largely dosed for daily smokers and may not be appropriate for intermittent smoking.

The goal of this analysis was to describe a cohort of adolescent intermittent smokers and compare them to adolescent daily smokers for the purpose of providing a more detailed characterization of intermittent smoking in adolescents. Specifically, we sought to describe patterns of smoking, level of self-reported addiction, and experience with cessation. We also sought to identify contextual factors (e.g., smoking when others are smoking or when stressed) differentiating between ITS and DS to examine the relevance of social and environmental triggers which may drive patterns of smoking in adolescents. Because of the belief that early smoking is mediated by social factors (Landrine, Richardson, Klonoff, & Flay, 1994; O'Neill, Glasgow, & McCaul, 1983), we hypothesize that among adolescents, both DS and ITS will list social situations in their top 3 smoking situations. However, it is expected that the patterns of smoking will be different between the two groups. Specifically, we hypothesize that ITS will smoke proportionally more cigarettes on the weekends, compared to the DS, for whom it is likely that the number of cigarettes smoked is relatively consistent throughout the week. Unlike adult ITS, who have been smoking longer, we also hypothesize that adolescent ITS will report less difficulty with and fewer attempts at cessation than DS.

2. Methods

2.1. Subjects

Two hundred two adolescent smokers aged 13–17 from the San Francisco bay area that smoked at least 1 cigarette per month were recruited as part of an ongoing longitudinal study of adolescent smoking. Adolescents responding to online, school, and clinic-based advertising were screened by telephone. Potential participants needed to be able to attend a 9-hour assessment visit and to be free of chronic diseases. In addition, parental consent was required for participation. Exclusion criteria included using any type of nicotine replacement therapy in the past week and being, or attempting to become, pregnant. Those who met eligibility requirements were invited to complete the study visit. Twenty-three (11.4%) participants did not report smoking in the prior month and were excluded from analysis. The final sample consisted of 129 ITS and 50 DS.

2.2. Informed consent

The research design and procedures were reviewed and approved by the University of California Institutional Review Board. Informed, written assent from the adolescent subject and consent from one parent were obtained for each subject before data collection.

2.3. Definitions

Participants were characterized as ITS if they reported smoking at least monthly, but fewer than 30 days per month. Participants who reported smoking on 30 days per month were classified as daily smokers (DS). Although there is no precise definition of non-daily or intermittent smoking, the most consistent definition seems to be smoking on fewer than 30 of the previous 30 days (DiFranza et al., 2007; Husten, 2009; Lindstrom & Isacsson, 2002). We therefore chose to adopt the above criteria to define our groups so as to parallel those found in other studies.

2.4. Procedures

A full description of the procedures is presented elsewhere (Rubinstein et al., 2013). In short, as part of a larger study of nicotine addiction in adolescents, participants completed detailed surveys that included questions about demographics and smoking behaviors including quit attempts. Participants were asked to report their frequency and quantity of cigarette smoking, and when they first tried smoking. Daily mean cigarettes smoked per day (CPD) were calculated using the mean number of cigarette participants reported smoking on each day of the week during a typical week. Frequency of smoking was determined by asking participants on how many days they smoke out of 30.

Participants were asked to review a list of 20 situations and then indicate the three top situations in which they smoke (e.g., social situations, drinking alcohol or when angry) (Shiffman et al., 2012). Two scales are commonly used to assess nicotine dependence in adolescents. The most commonly used scale is the Modified Fagerström Tolerance Questionnaire (mFTQ) which is derived from the adult Fagerstrom Test for Nicotine Dependence (FTND; Heatherton, Kozlowski, Frecker, & Fagerstrom, 1991), and has been validated in adolescents (Prokhorov et al., 2000). The Hooked on Nicotine Questionnaire (HONC) has been conceptualized as a measure of the loss of autonomy over tobacco use (J. R. DiFranza et al., 2002), even early in adolescents' smoking careers. Addiction was thus measured using the mFTQ and the HONC, both of which were scored continuously.

We also utilized the Items to Measure Readiness, Motivation, and Confidence in Ability to Change Smoking Behavior scale (Crittenden, Manfredi, Lacey, Warnecke, & Parsons, 1994). The two questions, "At present, how much do you want to cut down the number of cigarettes you smoke?" and "How much do you want to quit smoking?" were scored on a Likert scale of 1 = "not at all" to 4 = "very." The two questions, "If you wanted to cut down now, how sure are you that you would be able to do it?" and "If you decided to quit smoking completely, how sure are you that you would be able to do it?" were scored on a Likert scale of 1 = "not at all" to 4 = "very much."

2.5. Data analyses

ITS and DS were compared using univariate linear regression (for quantitative outcomes) or logistic regression (for binary outcomes). To account for possible differences in addiction scores between ITS and DS which may be related to race, sex, CPD or the duration of their smoking careers, regression analyses were adjusted for each of these variables. Because the number of cigarettes per day reported by participants was not normally distributed, it was square root transformed. To examine patterns of smoking throughout the week in both groups, we used generalized estimating equations (GEE) to conduct a repeated measures analysis taking into account within-subject correlations. The top three situations identified by the participants as most often

associated with smoking were analyzed using logistic regression, with subject status (DS vs. ITS) as the independent variable.

3. Results

As shown in Table 1, there were no gender, age or racial differences between the groups. Level of maternal education and alcohol use were also similar between groups.

3.1. Smoking behavior

On average, ITS began smoking at an older age (14.4 versus 13.3 years old, $p < .001$) and had been smoking for a shorter duration of time (1.6 years versus 2.8 years since smoking their first cigarette, $p < .001$; See Table 1). Among ITS, 53.2% reported having smoked at least 100 cigarettes in their lifetime versus 93.8% of DS ($p < .001$). ITS reported smoking a mean of 12.8 days per month (median = 12.00, SD = 8.7; see Fig. 1) and smoked significantly fewer cigarettes than DS on days when they smoked (1.79 CPD versus 5.77 CPD, $p < .001$). Both ITS and DS increased their smoking on Fridays and Saturdays (see Fig. 2); there was no statistical difference in this increase between the groups ($p = .09$).

3.2. Smoking situations

In an analysis of the top three situations where participants report smoking (see Table 2), ITS were less likely than DS to report smoking when feeling angry (OR = 0.43 [0.21, 0.89]) and were significantly more likely to report smoking when socializing (OR = 2.41 [1.11, 5.23]). There were no differences between groups in reports of smoking while drinking alcohol, feeling stressed, tense, relaxed or when others are smoking.

3.3. Dependence

Three percent of ITS and no DS achieved a score of 0 on the mFTQ ($p = .21$). On the mFTQ, ITS scored significantly lower than DS (see Table 3). This difference remained significant after adjusting for sex, race, CPD and years of smoking. On the HONC, 21.6% of ITS scored a 0 versus 2% of DS ($p = .002$). ITS scored significantly lower on the HONC than DS. However, this difference was no longer significant after adjusting for the above confounders.

Table 1
Characteristics of intermittent (ITS) and daily smokers (DS).

	ITS	DS	
	%/M (SD)	%/M (SD)	p
Gender (male)	34.9%	38.0%	.730
Race			.827
AA	18.6%	22.0%	
Caucasian	27.9%	26.0%	
Asian/other	7.0%	8.0%	
Hispanic	20.9%	16.0%	
Mixed	25.6%	26.0%	
Age	16.1 (1.0)	16.1 (.84)	.965
Mom's education			.096
High school or less	42.2%	34.7%	
Some college	17.2%	12.2%	
College graduate	18.8%	24.5%	
Graduate work	11.7%	6.1%	
Use of alcohol in past 30 days	67.8%	67.3%	.826
Age at smoking initiation	14.4 (1.4)	13.3 (1.5)	<.001
Total years of smoking	1.65 (1.4)	2.84 (1.5)	<.001

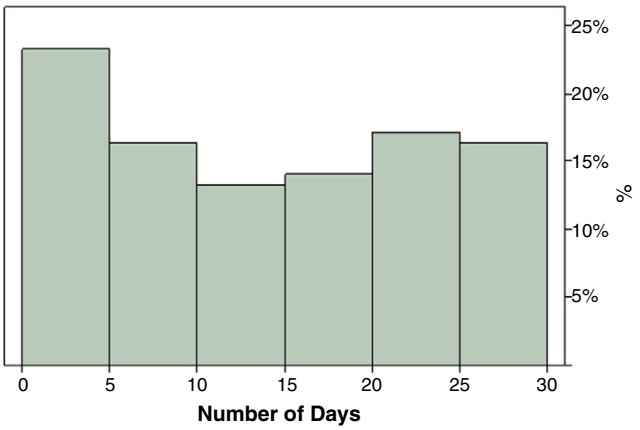

Fig. 1. Distribution of days smoked in the past 30 days among ITS.

3.4. Cessation

Similar percentages of ITS and DS reported having made a quit attempt since beginning to smoke (60.9% versus 70.0%, $p = .30$). The absolute number of quit attempts was similar between groups (5.8 versus 4.8, $p = .67$). ITS were more confident both in their ability to cut down the number of cigarettes they smoke and in their ability to quit smoking completely (3.39 [SD = 0.82] versus 2.56 [SD = 0.95], $p < .001$ and 3.35 [SD = 0.85] versus 2.41 [SD = 1.1], $p < .001$, respectively). There were no differences in desire to cut down or quit smoking between groups (2.41 [SD = 1.1] versus 2.39 [SD = 1.7], $p = .94$ and 2.46 [SD = 1.1] versus 2.32 [SD = 1.1], $p = .49$ respectively).

4. Discussion

There were a number of significant differences between ITS and DS among the adolescent smokers. On average, adolescent ITS began smoking at an older age and reported smoking significantly fewer CPD on the days when they smoked compared with DS. ITS also had significantly lower levels of addiction on the mFTQ, even after controlling for CPD and years of smoking. The fact that differences in addiction are

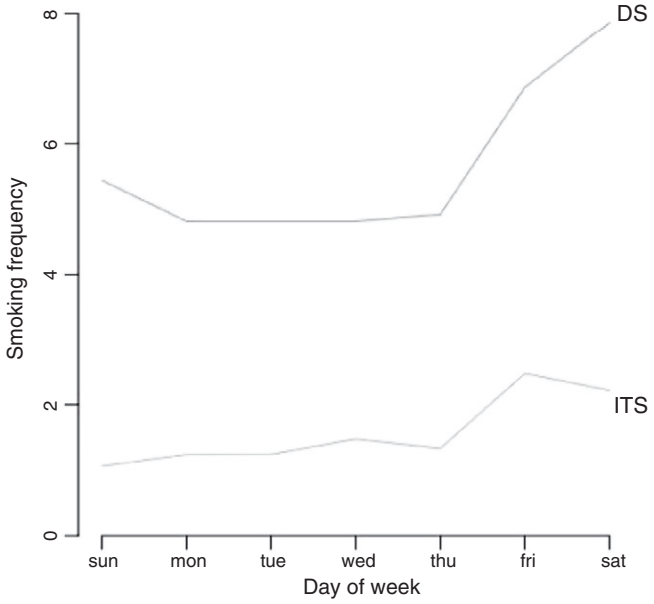

Fig. 2. Cigarettes per day (CPD) smoked across days of the week.

Table 2
Self-reported top three situations in which smoking is most common.

Variable	ITS %	DS %	OR	95% CI
Under stress	53.5	58.0	0.92	[0.46, 1.87]
When angry	26.4	54.0	0.43*	[0.21, 0.89]
When tense	10.9	24.0	0.84	[0.30, 2.34]
In a negative mood	14.7	20.0	0.82	[0.31, 2.14]
When relaxed	12.4	22.0	0.84	[0.30, 2.34]
Drinking alcohol	50.4	48.0	1.14	[0.57, 2.30]
When socializing	45.0	26.0	2.41*	[1.11, 5.23]
When others are smoking	44.2	38.0	1.39	[0.67, 2.88]

To save space, only the top 8 response categories (out of 20 possible) are included in this table.
* $p < .05$.

evident so early in these adolescents' smoking careers suggests that the DS and ITS constitute truly different cohorts, with different vulnerability to smoking and nicotine dependence.

Interestingly, despite non-daily smoking and distinctly lower addiction scores, most adolescent ITS nevertheless reported some symptoms of addiction. Specifically, even though adolescent ITS smoked on average 13 days per month, only 3% of participants scored zero on the mFTQ. This contrasts with data from adult ITS, many of whom had smoked for many years without progressing to daily smoking, where half of ITS scored 0 on the FTND (Shiffman et al., 2012). This, along with the fact that some were already smoking greater than 20 days per month suggests that some of the ITS are likely to progress to daily smoking; non-zero scores on the mFTQ could be an early sign of vulnerability to dependence.

Fitting with the stereotype of intermittent smoking which is sometimes referred to as "social" smoking, and as has been reported in adults (Schane, Glantz, & Ling, 2009; Shiffman et al., 2012), adolescent ITS were more likely to report smoking in social situations. Unlike adult ITS (Shiffman et al., 2012), adolescent ITS were less likely to report smoking when angry, suggesting that they are not smoking for affect regulation. Interestingly, there were no differences between ITS and DS with regard to smoking in other negative affective situations (i.e., smoking when tense or in a negative mood). Also differing from findings among adult and young adult ITS for whom social smoking is often accompanied by alcohol (Emmons, Wechsler, Dowdall, & Abraham, 1998; Hines, Fretz, & Nollen, 1998; Moran, Wechsler, & Rigotti, 2004; Shiffman et al., 2012), adolescent ITS were not more likely to report smoking when drinking alcohol. In fact, alcohol use was the second most commonly reported situation for smoking in both ITS and DS, suggesting that this context remains important for adolescents even once they have started smoking daily. Similarly, we found that both ITS and DS increased their cigarette consumption on the weekends, to roughly similar degrees; these early DS do not yet smoke at constant rates throughout the week. In some respects, both daily and non-daily adolescent smokers resemble adult ITS; the distinction DS and ITS may grow as smoking patterns progress into adulthood, where DS are characterized by heavier and more addicted smoking.

Finally, despite their non-daily smoking, ITS reported similar difficulty in quitting tobacco smoking as did DS. There were no differences between the groups in the number of attempts to quit. Both groups of participants reported roughly 5 quit attempts despite an average smoking history of less than 3 years. These findings suggest that although adolescent ITS only smoke a few days per month and had lower scores on addiction, something is driving them to smoke and is making it difficult to quit. However, despite their apparent difficulty in quitting, ITS were more confident in their ability to quit or cut down than were DS. The cause for the discrepancy between self-perceived and actual ability to quit is unclear and needs to be explored in future studies so that we may better target cessation efforts to this group.

4.1. Limitations

This is a cross sectional analysis; some of the adolescents who were ITS are in transition to either daily smoking or abstinence. Fortunately, we are collecting longitudinal data on these participants and should be able to answer such questions in the future. Another issue of note is the possibility of Type I error from the multiple analyses conducted. However, many of our findings, including later age of initiation, lesser addiction, and fewer cigarettes smoked per day are consistent with the findings reported in young adult ITS (Cooper et al., 2010; Levy et al., 2009), suggesting that they are indeed reflective of intermittent smoking. Our sample was predominantly female, which may limit its generalization to the wider population of adolescent smokers. However, we did not find any sex differences in our analyses, suggesting that sex did not play a role in the differentiation between daily and intermittent smoking. In addition, we also adjusted for sex in the addiction analyses. Finally, the relatively small and localized sample may limit generalizability nationally. However, as stated above, many of our findings are consistent with those reported by others.

5. Conclusions

We documented significant differences in smoking related behaviors between adolescent ITS and DS. Of interest was the finding that despite infrequent and low quantity smoking, most of the ITS reported initial signs of addiction. Further, most have tried and failed to quit smoking. Given the risks from even light or intermittent smoking – including the risk of progressing to daily and heavy smoking – it is essential that we develop a greater understanding of adolescent ITS, including their difficulty in quitting and the contextual factors influencing their smoking so that we may develop new targeted interventions to help these smokers quit as early as possible.

Disclosures

All authors have contributed significantly to the study design, analysis, interpretation, and writing and names on this manuscript, and take responsibility for the manuscript's contents. There are no competing interests with any of the authors involved with the production of this manuscript.

None of the authors have sources of funding, direct or indirect, and/or any connection with the tobacco, alcohol, or gaming industries or anybody substantially funded by one

Table 3
Differences in dependence between intermittent smokers (ITS) and daily smokers (DS).

	ITS	DS	Unadjusted			Adjusted[a]		
	M (SD)	M (SD)	OR	CI	*p* value	OR	CI	*p* value
mFTQ[b]	1.96 (1.0)	3.76 (1.4)	0.07	[0.03, 0.13]	<.001	0.26	[0.11, 0.57]	<.001
HONC[c]	3.48 (3.0)	6.53 (2.8)	0.18	[0.09, 0.32]	<.001	0.78	[0.35, 1.73]	.54

[a] Adjusted for sex, race, CPD and years of smoking.
[b] Modified Fagerström Tolerance Questionnaire total score.
[c] Hooked on Nicotine Checklist total score.

of these organizations. Dr. Shiffman consults for GlaxoSmithKline exclusively on smoking cessation. All other authors declare that they have no conflicts of interest.

Acknowledgements

This study was supported by NIH/NCI R01 CA140216 and NIH/NCRR UCSF-CTSI Grant Number UL1 RR024131. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the NIH.

The authors would like to thank Ms. Jennifer Simington, Ms. Grace Wu and Mr. Max Berlyant for their assistance with data collection and participant recruitment.

References

Benowitz, N. L. (2010). Nicotine addiction. *The New England Journal of Medicine*, *362*, 2295–2303.

Centers for Disease Control, Prevention (2013). Youth Risk Behavior Survey. Available at: www.cdc.gov/yrbs (Accessed on April 3, 2014)

Colby, S. M., Tiffany, S. T., Shiffman, S., & Niaura, R. S. (2000). Are adolescent smokers dependent on nicotine? A review of the evidence. *Drug and Alcohol Dependence*, *59*(Suppl. 1), S83–S95.

Cooper, T. V., Taylor, T., Murray, A., DeBon, M. W., Vander Weg, M. W., Klesges, R. C., et al. (2010). Differences between intermittent and light daily smokers in a population of U.S. military recruits. *Nicotine & Tobacco Research: Official Journal of the Society for Research on Nicotine and Tobacco*, *12*, 465–473.

Crittenden, K. S., Manfredi, C., Lacey, L., Warnecke, R., & Parsons, J. (1994). Measuring readiness and motivation to quit smoking among women in public health clinics. *Addictive Behaviors*, *19*, 497–507.

DiFranza, J. R., Savageau, J. A., Fletcher, K., O'Loughlin, J., Pbert, L., Ockene, J. K., et al. (2007). Symptoms of tobacco dependence after brief intermittent use: The Development and Assessment of Nicotine Dependence in Youth-2 study. *Archives of Pediatrics & Adolescent Medicine*, *161*, 704–710.

DiFranza, J. R., Savageau, J. A., Rigotti, N. A., Fletcher, K., Ockene, J. K., McNeill, A.D., et al. (2002). Development of symptoms of tobacco dependence in youths: 30 month follow up data from the DANDY study. *Tobacco Control*, *11*, 228–235.

DiFranza, J., Wellman, R. J., Mermelstein, R., Pbert, L., Klein, J.D., Sargent, J.D., et al. (2011). The natural history and diagnosis of nicotine addiction. *Current Pediatric Reviews*, *88–96*.

Emmons, K. M., Wechsler, H., Dowdall, G., & Abraham, M. (1998). Predictors of smoking among US college students. *American Journal of Public Health*, *88*, 104–107.

Heatherton, T. F., Kozlowski, L. T., Frecker, R. C., & Fagerstrom, K. O. (1991). The Fagerstrom Test for nicotine dependence — A revision of the Fagerstrom Tolerance Questionnaire. *British Journal of Addiction*, *86*, 1119–1127.

Hines, D., Fretz, A.C., & Nollen, N. L. (1998). Regular and occasional smoking by college students: Personality attributions of smokers and nonsmokers. *Psychological Reports*, *83*, 1299–1306.

Husten, C. G. (2009). How should we define light or intermittent smoking? Does it matter? *Nicotine & Tobacco Research: Official Journal of the Society for Research on Nicotine and Tobacco*, *11*, 111–121.

Kandel, D. B., & Chen, K. (2000). Extent of smoking and nicotine dependence in the United States: 1991–1993. *Nicotine & Tobacco Research*, *2*, 263–274.

Landrine, H., Richardson, J. L., Klonoff, E. A., & Flay, B. (1994). Cultural diversity in the predictors of adolescent cigarette smoking: The relative influence of peers. *Journal of Behavioral Medicine*, *17*, 331–346.

Levy, D. E., Biener, L., & Rigotti, N. A. (2009). The natural history of light smokers: A population-based cohort study. *Nicotine & Tobacco Research: Official Journal of the Society for Research on Nicotine and Tobacco*, *11*, 156–163.

Lindstrom, M., & Isacsson, S. O. (2002). Long term and transitional intermittent smokers: A longitudinal study. *Tobacco Control*, *11*, 61–67.

Moran, S., Wechsler, H., & Rigotti, N. A. (2004). Social smoking among US college students. *Pediatrics*, *114*, 1028–1034.

O'Loughlin, J., DiFranza, J., Tyndale, R. F., Meshefedjian, G., McMillan-Davey, E., Clarke, P. B., et al. (2003). Nicotine-dependence symptoms are associated with smoking frequency in adolescents. *American Journal of Preventive Medicine*, *25*, 219–225.

O'Neill, H. K., Glasgow, R. E., & McCaul, K. D. (1983). Component analysis in smoking prevention research: Effects of social consequences information. *Addictive Behaviors*, *8*, 419–423.

Prokhorov, A. V., De Moor, C., Pallonen, U. E., Hudmon, K. S., Koehly, L., & Hu, S. (2000). Validation of the modified Fagerström tolerance questionnaire with salivary cotinine among adolescents. *Addictive Behaviors*, *25*, 429–433.

Rubinstein, M. L., Shiffman, S., Moscicki, A.B.., Rait, M.A., Sen, S., & Benowitz, N. L. (2013). Nicotine metabolism and addiction among adolescent smokers. *Addiction*, *108*, 406–412.

Schane, R. E., Glantz, S. A., & Ling, P.M. (2009). Social smoking implications for public health, clinical practice, and intervention research. *American Journal of Preventive Medicine*, *37*, 124–131.

Schane, R. E., Ling, P.M., & Glantz, S. A. (2010). Health effects of light and intermittent smoking: A review. *Circulation*, *121*, 1518–1522.

Services, U. S. D. o. H. a. H. (2012). *Preventing tobacco use among youth and young adults: A report of the surgeon general*. Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health.

Shiffman, S., Tindle, H., Li, X., Scholl, S., Dunbar, M., & Mitchell-Miland, C. (2012). Characteristics and smoking patterns of intermittent smokers. *Experimental and Clinical Psychopharmacology*, *20*, 264–277.

Tindle, H. A., & Shiffman, S. (2011). Smoking cessation behavior among intermittent smokers versus daily smokers. *American Journal of Public Health*, *101*, e1–e3.