Published in final edited form as:

Psychol Addict Behav. 2008 March ; 22(1): 129–134. doi:10.1037/0893-164X.22.1.129.

Adolescent Reasons for Quitting Smoking: Initial Psychometric Evaluation

Mark G. Myers and

Psychology Service, Veteran Affairs San Diego Healthcare System and Department of Psychiatry, University of California, San Diego

Laura MacPherson

Center for Alcohol and Addictions Studies, Brown University

Abstract

Most adolescent smokers report intentions to quit and the majority attempt cessation. Yet, little is known regarding the relationship between adolescent motives for cessation and smoking cessation efforts. To this end, the present study describes an initial evaluation of the psychometric characteristics of the Adolescent Reasons for Quitting scale (ARFQ), a measure of adolescent motives for smoking cessation. Participants were 109 current smoking high school students assessed at baseline and 6-month follow up. The ARFQ item content and format was developed in a separate qualitative study with 36 high school students who had previously attempted to quit smoking. Exploratory factor analyses of ARFQ items yielded three subscales: short-term consequences, social disapproval, and long-term concerns. Validation analyses were conducted in relation to concurrent intentions to stop smoking and prospective smoking cessation attempts, providing evidence of concurrent, predictive and discriminant validity. In particular, the social disapproval and long-term concern subscales significantly predicted subsequent cessation attempts. As such, the ARFQ may prove valuable for informing interventions to encourage adolescent smoking cessation.

Keywords

Adolescent; cessation motives; smoking cessation; psychometric evaluation; prospective study

Investigations of adolescent smokers consistently reveal that the majority attempt cessation and report intentions to quit (Ershler, Leventhal, Fleming, & Glynn, 1989; Stanton, Lowe, & Gillespie, 1996; Sussman et al., 1998). Thus, many teens attempt to modify cigarette use behaviors without formal treatment (i.e., engage in self-change efforts). Reasons for quitting can be conceptualized as factors or motives perceived by adolescents to influence their desire to stop smoking. The most commonly cited reasons for quitting by youth are health concerns (Aung, Hickman, & Moolchan, 2003; Riedel, Robinson, Klesges, & McLain-Allen, 2002; Sussman et al., 1998). Other frequently reported reasons include social (peer or family) concerns, and proximal consequences such as cost of cigarettes or impairment of physical activities (Aung et al., 2003; Myers & MacPherson, 2004; Riedel et al., 2002; Sussman et al., 1998). Previous studies typically included a limited range of items and were cross-sectional in nature (Myers & MacPherson, 2004; Sussman et al., 1998), thus unable to link particular reasons with quitting behaviors. These studies have identified broad categories of reasons for

quitting, yet finer distinctions will better characterize determinants of cessation efforts (McCaul et al., 2006).

Two studies have reported on the validity of instruments designed to assess adolescent reasons for quitting smoking. Fisher and colleagues (1999) developed an empirically derived scale that yielded two factors, both significantly associated with concurrent intentions to change behavior and prior cessation attempts. However, predictive validity was not assessed. Turner and Mermelstein (2004) published a measure for which exploratory factor analysis yielded a single factor solution. The authors examined the predictive utility of each individual motive in relation to abstinence following a smoking intervention. This study represented an important contribution by conducting a prospective evaluation of reasons for quitting in adolescent smokers.

Existing models of addictive behavior change have been based on adults, and thus may not adequately characterize the adolescent self-change process. To address this issue, the developmental social information processing model (Coie & Dodge, 1998) has recently been adapted to the study of youth addictive behavior self-change (Brown, 2001; Brown, Anderson, Schulte, Sintov, & Frissell, 2005). This social cognition model postulates that proximal cognitive and emotional states lead to engagement in substance use within a social context. Further, factors related to initial actions in support of cessation of substance use (i.e., a quit attempt) are proposed to differ from those required to sustain behavior change. Hypothesized influences on engaging in a quit attempt include reasons for quitting, intentions to quit (e.g., desire to quit, stage of change), and the anticipated consequences of smoking cessation. In support of this two-phase conceptualization, a recent review of the literature on adult reasons for smoking cessation concluded that reasons for quitting better predict desire to quit and cessation attempts than cessation outcomes (McCaul et al., 2006). Whether this relationship holds prospectively among adolescent smokers is currently unknown. Identifying reasons that predict quit attempts can provide information regarding how to motivate youth to change their smoking behavior.

The present report describes the initial psychometric validation of a measure of adolescent reasons for quitting smoking. Exploratory factor analyses were conducted to identify factor structure. The resulting subscales were evaluated for construct validity. Hypotheses were based on the social cognition model of adolescent addictive behavior self-change. First, it was hypothesized that subscale scores reflecting greater importance of reasons for quitting would be significantly related with greater desire to quit and higher stage of readiness for change. Next, higher scores on reasons for quitting subscales were hypothesized to be significantly predictive of subsequent attempts to quit smoking. Finally, we anticipated that the emergent subscales would show non-significant relationships with abstinence duration following a cessation attempt. To our knowledge, this is the first study to prospectively examine reasons for quitting in relation to adolescent self-change smoking cessation attempts.

Methods

Subjects

Inclusion criteria were 1) high school student 14 to 19 years old, and 2) having smoked a cigarette in the past 30 days. Participants were 109 high school students (56% female) who reported smoking in the past 30 days. Students ranged in age from 14-19 with a mean age of 16.7 (SD=1.0). The ethnic distribution of the sample was as follows: 71% White, 10% Hispanic, 6% Asian, 12% Mixed race, and 1% African American. Participants' baseline smoking characteristics and cessation motivation variables are shown in Table 1.

Procedure

Participants were recruited from four public high schools in southern California. Informed consent (assent for minors under age 18) was obtained from adolescent participants and parents of minors. Parents were not informed of their teen's current smoking status. Assessment occurred at baseline and six-month follow-up. In-person semi-structured interviews were conducted at both time points in addition to completion of self-report questionnaires. Smoking status was verified at each interview by measuring expired breath carbon monoxide.

Measures

Current cigarette use quantity and frequency was assessed for the past 90 days using the timeline follow-back procedure (TLFB; Sobell & Sobell, 1992). The TLFB has been shown to have good reliability and validity with adolescent smokers (Lewis-Esquerre et al., 2005).

Nicotine dependence was assessed using the 7-item Fagerstrom Tolerance Questionnaire modified for adolescents (mFTQ) for which adequate reliability and validity has been demonstrated (Prokhorov, Pallonen, Fava, Ding, & Niaura, 1996).

Intentions for smoking cessation were assessed as part of the baseline semi-structured interview with two continuous items scored on a 10-point Likert-type scale (likelihood of not smoking in one year and current desire to quit smoking) and with the 4-item stage of change algorithm (SCA – Smoking; Velicer, Prochaska, Rossi, & Snow, 1992).

Cessation efforts were assessed during the interval between baseline and follow-up as part of each in-person semi-structured interview. For purposes of the present study a cessation attempt was defined as an intentional attempt to quit smoking lasting at least 24 hours.

Reasons for quitting were assessed with the Adolescent Reasons for Quitting questionnaire (ARFQ). This measure was developed in a separate qualitative study with 36 high school students who had previously attempted to quit smoking. Three focus groups were conducted in which reasons for quitting were generated, both verbally, in a group discussion format, and as written responses to open-ended questions printed on handouts. Each session was audiotaped and transcribed. Next, a classification system was developed in order to ensure that a representative range of items would be presented to three instrument feedback focus groups. Four broad categories were identified based on existing literature regarding youth reasons for quitting (e.g., Stanton et al., 1996; Sussman et al., 1998) and on content analysis of the transcripts: 1) health 2) interpersonal, 3) negative consequences, and 4) addiction/loss of control. Responses from the instrument development focus group transcripts and written responses were then sorted by three independent raters into these categories. During feedback focus groups, participants were presented with approximately 30 reasons for quitting representing the categories listed above. Participants in these focus groups were asked to 1) provide feedback on item wording, content, and clarity, 2) adjust item wording that was perceived as confusing or awkward, and 3) offer feedback on rating scales and response options to be used with the eventual questionnaire items. The resulting ARFQ included 27 items rated on current importance for quitting on a 5-point scale from 0 (not a reason to stop smoking) to 4 (extremely important reason to stop smoking).

Results

Exploratory Factor Analyses

Principal axis factoring, with an oblique promax rotation was employed for factor derivation. Unconstrained exploratory factor analysis (EFA) of the ARFQ items identified six eigenvalues > 1 and generated a scree plot that indicated a strong first factor (eigenvalue = 8.63) and a

natural break at the third factor. Factors four through six each accounted for less than 5% variance. Based on these results, all 27 ARFQ items were submitted to an EFA forcing extraction of two, three, and four factors. After rotation, the three-factor solution was retained because a) it produced more conceptually interpretable factors than the two-factor solution, b) did not produce a splitting of the first factor into two highly correlated ($r = .67$) conceptually similar factors as did the four factor solution, and c) was meaningfully interpretable. The three-factor solution included a short-term consequences factor, a social disapproval factor, and a factor reflecting concerns about smoking in the future (labeled long-term concerns).

EFA's were run again and items retained if they had a loading $> .40$ on their primary factor and loadings $\leq .30$ on any other factor, and were consistent with factor content (Floyd & Widaman, 1995). Four iterations of this process resulted in a three-factor solution comprising 18 items. One item (Family illness/death) was removed due to inconsistency with factor content on the social disapproval subscale. Another item (shortness of breath) was removed due to a high correlation ($r = .71$) with the "can't breathe while exercising" item on the short-term consequences subscale in order to preserve the more specific content item. Removal did not meaningfully reduce variance accounted for or internal consistency of the subscale. As shown in Table 2, the final model included 16 items accounting for 55.2% of the variance. The factors accounted for 34.1%, 12.6%, and 8.5% of the total variance respectively. Items were unit weighted and summed to compute subscale scores. Correlations among the subscales were moderate, ranging from $r = .41$ to $.45$. Subscale Cronbach's alpha ranged from $.72$ to $.87$, indicating adequate internal consistency. Means and standard deviations for the three factors are shown in Table 3

Validation Analyses

Initial analyses examined the ARFQ subscales in relation to perceived likelihood of not smoking in one year, desire to quit, and stage of change. Family-wise corrections (Dar, Serlin, & Omer, 1994) were employed to account for multiple analyses, with significance level set at $.017$. Pearson and Spearman Rank-Order correlations were employed as appropriate. Subscale 1 (short-term consequences) was significantly related with desire to quit ($r = .25$, $p = .009$). Subscale 2 (social disapproval) related marginally with desire to quit ($r = .20$, $p = .035$) and was significantly associated with stage of change ($r = .28$, $p = .004$). Subscale 3 (long-term concerns) was significantly related with each validation variable; likelihood of not smoking ($r = .27$, $p = .010$), desire to quit ($r = .31$, $p < .001$), and stage of change ($r = .38$, $p < .001$).

Logistic regression analyses were conducted to evaluate the predictive utility of baseline ARFQ scale scores in relation to cessation attempts during the follow up period. Given that motivation for quitting may change relatively rapidly, reasons for quitting were examined as predictors for quit attempts occurring more proximally (i.e., three months after baseline) as well as for the full 6-month follow up interval. Of the original 109 participants, 99 (91%) completed 6-month follow-up assessments, of whom 44 reported a cessation attempt. Of these 21 had attempted cessation in the three months immediately following baseline. In order to account for the potential influence of baseline smoking on cessation attempts, nicotine dependence (mFTQ score) and past 30 day smoking (total number of cigarettes) were examined in relation to quit attempts. The only significant association was between past 30 day smoking and cessation attempts in the 1st three months following baseline ($r = -.24$, $p = .019$; all other p 's $> .10$).

For the first analysis subscale scores were entered as a block to predict cessation attempts over the full 6-month follow-up interval, yielding a significant overall model ($\chi^2(3) = 8.3$, $p = .04$). Examination of odds ratios (OR's) indicated that subscale 2 (social disapproval) was the only significant predictor (OR=1.1, 95% CI = 1.01 – 1.21, $p = .04$). A second logistic regression was conducted to examine prediction for more proximal cessation attempts (i.e., in the 1st 3-

months following baseline). This regression, with past month smoking entered as a covariate, yielded a significant overall model ($\chi^2(4) = 20.3, p < .001$). Only the long-term concerns subscale significantly predicted quit attempts ($OR = 1.8, 95\% CI = 1.16$ to $2.89, p = .010$).

Finally, a linear regression was conducted to examine the hypothesis that baseline ARFQ subscale scores would not significantly predict length of abstinence following a quit attempt. Participants who had attempted cessation reported from 2 to 174 days of abstinence, with a median of 21 days. The regression was not significant ($F(3,40) = .58, p = .63$) indicating that reasons for quitting were not predictive of abstinence duration.

Discussion

The present study reported on the psychometric characteristics of the Adolescent Reasons for Quitting scale (ARFQ), a measure of adolescent motives for smoking cessation. Exploratory factor analyses yielded three subscales; short-term consequences, social disapproval, and long-term concerns. The short-term consequences subscale showed only a modest correlation with desire to quit and was not a significant predictor of cessation attempts. The social disapproval subscale showed concurrent association with motivation for smoking cessation and significantly predicted cessation attempts over the 6-month follow up period. The content of this subscale highlights the salience of social influences for adolescents. Finally, the long-term concerns subscale showed the strongest relationships with concurrent intentions for cessation, and significantly predicted quit attempts in the three months following baseline.

It has been hypothesized that immediate consequences are more important than distal factors for adolescent self-change efforts (Brown, 2001). Similarly, research on risk-perception indicates that young smokers tend to discount the extent of personal risk (Bentlin, Slovic, & Severson, 1993; Leventhal, Glynn, & Fleming, 1987; Slovic, 2000), suggesting that awareness of long-term consequences of smoking is unlikely to translate into behavior change. In contrast, the present results indicate that smoking cessation attempts were predicted by concerns about future smoking, yet proximal consequences appeared insufficient to motivate behavior change. It may be that youth discount or fail to attend to short-term consequences of their smoking when making decisions regarding behavior change. Conversely, youth who acknowledge concerns regarding the long-term risks of smoking appear more likely to engage in behavior change efforts. Recent models of risk perception have emphasized the role of affect in decision making processes (Slovic, Peters, Finucane, & MacGregor, 2005). It may be that for some youth long-term consequences are more affectively charged due to their perceived severity in comparison to short-term consequences (e.g., dying from lung cancer vs. being out of breath walking up stairs), and thus increase their importance as reasons for quitting. As such, identifying factors or individual characteristics associated with increased salience of long-term smoking risks will be valuable for motivating youth to change their smoking behavior.

The present findings provide initial support for the social cognition model of adolescent addictive behavior self-change as applied to smoking cessation. First, hypothesized relationships between ARFQ subscales and motivation for smoking cessation variables were largely supported. In addition, consistent with the hypothesized two-phase process ARFQ subscales predicted cessation attempts but not abstinence duration. This finding provides evidence of discriminant validity and is consistent with previous research indicating that the relative influence of key constructs may vary across different phases of the smoking behavior change process (Baldwin et al., 2006; Rothman, 2000).

Different relationships emerged between subscales and quit attempts depending on the time frame considered; social disapproval predicted cessation efforts over the full follow up interval, but not for the first three months, while the opposite pattern was observed for long-term

concerns. The present findings may reflect that variables related to motivation for behavior change fluctuate over time. For example, concern about long-term effects of smoking may be triggered by an acute event, and thus relatively short lived. Conversely, social disapproval may be a more temporally stable concern whose influence is more apparent over a longer time period. The present pattern of results serves to highlight the dynamic nature of the smoking behavior change process, whereby the influence of key variables changes over time.

The present pattern of results demonstrates differences from and similarities with studies of adult reasons for smoking cessation. For example, measures of adult reasons for quitting smoking have been found to reflect intrinsic (such as health) versus extrinsic (such as social influence) dimensions, and have relatively homogenous subscale content (Curry, Wagner, & Grothaus, 1990; Curry, Grothaus, & McBride, 1997). The ARFQ, in contrast, has one intrinsic (long-term concerns), one extrinsic (social disapproval) and one mixed intrinsic/extrinsic subscale (short-term consequences). This pattern is consistent with studies suggesting that homogeneity of content within domains of substance related cognitions increases with cognitive maturation and experience with substance use (Christiansen, Goldman, & Inn, 1982). As with adult studies (Curry et al., 1997), the present findings indicated a stronger relationship between cessation efforts and intrinsic as opposed to extrinsic reasons for quitting. Yet, previous studies with adolescents have yielded inconsistent findings in this regard (Fisher, Stanton, & Lowe, 1999; Turner & Mermelstein, 2004), indicating the need for further examination of this issue.

Development of the ARFQ contributes to and extends the literature on adolescent reasons for quitting smoking in a number of ways. The ARFQ was developed through a formative process, in which items were generated by adolescents with prior quit attempts. This is in contrast to existing measures which were based on items extracted from adult measures or from focus groups that included adolescents who had no history of quit attempts (Fisher, Stanton, & Lowe, 1999; Turner & Mermelstein, 2004). In addition, existing measures employed dichotomous scoring (yes/no), while the ARFQ incorporates importance ratings which permit identification of reasons for quitting that are most salient to an adolescent. Finally, this is the first study to examine the predictive validity of dimensions rather than individual reasons for quitting.

Several limitations to the present study caution that these findings be viewed as preliminary. The small sample, high proportion of daily smoking participants and use of exploratory analytic techniques highlight the need for cross validation and confirmatory factor analyses to replicate the obtained factor structure. In particular, correlation coefficients for exploratory factor analysis may be less reliable when estimated from smaller samples (Tabachnick & Fidell, 2001b). Also, the reliance on single-source self-report responses may inflate correlations among variables. Future work with this measure should incorporate multimodal assessments to avoid concerns related to method variance. As the long-term concerns subscale included only two items, other items to adequately capture this construct should be explored. In addition, findings that the relationships between subscale scores and quit attempts differed depending on duration following baseline assessment highlight the temporal variability of motivation for change and indicate the importance of briefer assessment intervals. Design of the present study did not permit evaluation of the direction of relationship between reasons for quitting and cessation motivation. Examination of whether greater perceived importance of reasons for quitting leads to higher motivation for change or vice versa may prove valuable for informing treatment design and elucidating the smoking cessation process (e.g., Turner & Mermelstein, 2004). Finally, future studies should examine whether the associations between reasons for quitting and cessation motivation or quit attempts vary by gender.

This preliminary evaluation provides initial support for the validity and utility of the ARFQ. At the present time the ARFQ may be useful for enhancing our global understanding of the

adolescent smoking cessation process (e.g., demonstrating that reasons for quitting predict cessation attempts). Ultimately, this measure has the potential to inform intervention design by identifying reasons for quitting that predict proximal cessation attempts. However, this more specific application awaits cross validation studies to confirm the underlying factor structure.

Acknowledgments

This work was supported by grants from the California Tobacco Related Disease Research Program (10IT-0280) and the National Institute on Drug Abuse (K02 DA17652). We would like to thank the administrators, staff and teachers at the participating high schools for their assistance and support in conducting this study.

References

- Aung AT, Hickman NJ, Moolchan ET. Health and performance related reasons for wanting to quit: gender differences among teen smokers. *Substance Use & Misuse* 2003;38(8):1095–1107. [PubMed: 12901450]
- Baldwin AS, Rothman AJ, Hertel AW, Linde JA, Jeffery RW, Finch EA, et al. Specifying the determinants of the initiation and maintenance of behavior change: an examination of self-efficacy, satisfaction, and smoking cessation. *Health Psychology* 2006;25(5):626–634. [PubMed: 17014280]
- Benthin A, Slovic P, Severson H. A psychometric study of adolescent risk perception. *Journal of Adolescence* 1993;16(2):153–168. [PubMed: 8376640]
- Brown, SA. Facilitating change for adolescent alcohol problems: a multiple options approach. In: Wagner, EF.; Waldron, HB., editors. *Innovations in Adolescent Substance Abuse*. Oxford, UK: Elsevier; 2001. p. 169-187.
- Brown SA, Anderson KG, Schulte MT, Sintov ND, Frissell KC. Facilitating youth self-change through school-based intervention. *Addictive Behaviors* 2005;30:1797–1810. [PubMed: 16111834]
- Burt RD, Peterson AV. Smoking cessation among high school seniors. *Preventive Medicine* 1998;27:319–327. [PubMed: 9612822]
- Christiansen BA, Goldman MS, Inn A. Development of alcohol-related expectancies in adolescents: Separating pharmacological from social-learning influences. *Journal of Consulting and Clinical Psychology* 1982;50:336–344. [PubMed: 7096736]
- Coie, JD.; Dodge, KA. Aggression and antisocial behavior. In: Damon, W.; Eisenberg, N., editors. *Handbook of child psychology: Social, emotional and personality development*. New York, NY: John Wiley & Sons, Inc.; 1998. p. 779-862.
- Curry S, Wagner EH, Grothaus LC. Intrinsic and extrinsic motivation for smoking cessation. *Journal of Consulting and Clinical Psychology* 1990;58(3):310–316. [PubMed: 2195084]
- Curry SJ, Grothaus L, McBride C. Reasons for quitting: intrinsic and extrinsic motivation for smoking cessation in a population-based sample of smokers. *Addictive Behaviors* 1997;22(6):727–739. [PubMed: 9426790]
- Dar R, Serlin RC, Omer H. Misuse of statistical test in three decades of psychotherapy research. *Journal of Consulting and Clinical Psychology* 1994;62(1):75–82. [PubMed: 8034833]
- Ershler J, Leventhal H, Fleming R, Glynn K. The quitting experience for smokers in sixth through twelfth grades. *Addictive Behaviors* 1989;14:365–378. [PubMed: 2782120]
- Fisher KJ, Stanton WR, Lowe JB. Healthy behaviors, lifestyle, and reasons for quitting smoking among out-of-school youth. *Journal of Adolescent Health* 1999;25(4):290–297. [PubMed: 10505847]
- Floyd FJ, Widaman KF. Factor analysis in the development and refinement of clinical assessment instruments. *Psychological Assessment* 1995;7(3):286–299.
- Leventhal H, Glynn K, Fleming R. Is the smoking decision an ‘informed choice’? Effect of smoking risk factors on smoking beliefs. *Journal of the American Medical Association* 1987;257(24):3373–3376. [PubMed: 3586266]
- Lewis-Esquerre JM, Colby SM, Tevyaw TO, Eaton CA, Kahler CW, Monti PM. Validation of the timeline follow-back in the assessment of adolescent smoking. *Drug and Alcohol Dependence* 2005;79(1): 33–43. [PubMed: 15943942]

- McCaul KD, Hockemeyer JR, Johnson RJ, Zetocha K, Quinlan K, Glasgow RE. Motivation to quit using cigarettes: a review. *Addictive Behaviors* 2006;31(1):42–56. [PubMed: 15916861]
- Myers MG, MacPherson L. Smoking Cessation Efforts Among Substance Abusing Adolescents. *Drug and Alcohol Dependence* 2004;73:209–213. [PubMed: 14725961]
- Prokhorov AV, Koehly LM, Pallonen UE, Hudmon KS. Adolescent nicotine dependence measured by the modified Fagerstrom Tolerance Questionnaire at two time points. *Journal of Child and Adolescent Substance Abuse* 1998;7(4):35–47.
- Prokhorov AV, Pallonen UE, Fava JL, Ding L, Niaura R. Measuring nicotine dependence among high-risk adolescent smokers. *Addictive Behaviors* 1996;21:117–127. [PubMed: 8729713]
- Riedel BW, Robinson LA, Klesges RC, McLain-Allen B. What motivates adolescent smokers to make a quit attempt? *Drug and Alcohol Dependence* 2002;68(2):167–174. [PubMed: 12234646]
- Rothman AJ. Toward a theory-based analysis of behavioral maintenance. *Health Psychology* 2000;19(1 Suppl):64–69. [PubMed: 10709949]
- Slovic P. What does it mean to know a cumulative risk? Adolescents' perceptions of short-term and long-term consequences of smoking. *Journal of Behavioral Decision Making* 2000;13(2):259–266.
- Slovic P, Peters E, Finucane ML, MacGregor DG. Affect, risk, and decision making. *Health Psychology* 2005;24:S35–S40. [PubMed: 16045417]
- Sobell, LC.; Sobell, MB. Time-line follow-back: A technique for assessing self-reported alcohol consumption. In: Litten, RZ.; Allen, JP., editors. *Measuring Alcohol Consumption: Psychosocial and Biochemical Methods*. Totowa, NJ: Pergamon Press; 1992. p. 73-98.
- Stanton WR, Lowe JB, Gillespie AM. Adolescents' experiences of smoking cessation. *Drug and Alcohol Dependence* 1996;43:63–70. [PubMed: 8957144]
- Sussman S, Dent CW, Nezami E, Stacy AW, Severson H, Burton D, et al. Reasons for quitting and smoking temptation among adolescent smokers: Gender differences. *Substance Use and Misuse* 1998;33:2705–2722.
- Tabachnick, BG.; Fidell, LS. *Computer-Assisted Research Design and Analysis*. Boston: Allyn and Bacon; 2001a.
- Tabachnick, BG.; Fidell, LS. *Using Multivariate Statistics*. Vol. 4. Needham Heights, MA: Allyn & Bacon; 2001b.
- Turner LR, Mermelstein R. Motivation and reasons to quit: predictive validity among adolescent smokers. *American Journal of Health Behaviors* 2004;28(6):542–550.
- Velicer WF, Prochaska JO, Rossi JS, Snow MG. Assessing outcome in smoking cessation studies. *Psychological Bulletin* 1992;111:23–41. [PubMed: 1539088]

Table 1
Baseline Cigarette-Use and Motivation for Cessation (N=109)

Variable	
Cigarette-use:	
Smoking frequency (% smoking daily)	46.8
Cigarettes per day (<i>M(SD)</i>)	5.96 (5.48)
mFTQ score (<i>M(SD)</i>)	3.34 (1.53)
Motivation for cessation:	
Likelihood of being a non-smoker in one year (<i>M(SD)</i>) (1=very unlikely, to 10=very likely)	5.71 (2.80)
Desire to quit (<i>M(SD)</i>) (1=not at all, to 10=very much)	3.58 (3.03)
Stage of Change (%)	
Precontemplation	61.5
Contemplation	22.0
Preparation	10.1
Action	3.4

Table 2

Exploratory Factor Analysis (EFA) item loadings of the 16-item Adolescent Reasons for Quitting (ARFQ) measure.

ARFQ Items	EFA loadings on factors		
	Short-term consequences ($\alpha=.87$)	Social disapproval ($\alpha=.72$)	Long-term concerns ($\alpha=.82$)
I walk up stairs and I'm out of breath.	.82	-.15	
I'm coughing up stuff every day.	.80	-.19	
I can't breathe when exercising (jogging, working out, surfing, etc.).	.67		
I feel like cigarettes are controlling my life.	.67		.16
Other people are thinking that I smell or look bad (yellow teeth/ nails, bad breath, etc.).	.63	.19	
I get sick more often because of smoking.	.59		
Smoking gets me in trouble at school or with the police (citations, etc.).	.57		-.17
My stuff gets damaged because of my smoking (burns on clothes, car, etc.).	.53	.26	
I keep smoking cigarettes out of habit, even though I don't want to.	.50	.10	.12
People I date/go out with don't like me smoking.		.66	
I don't want my parents to find out.	-.15	.63	
My friends who don't smoke give me a hard time.	-.10	.60	.12
My parents are really upset about me smoking.		.54	
I joined a group or organization that didn't like my smoking (church, youth group, etc.).	.21	.52	-.16
I don't want to get sick when I'm older if I still smoke (get cancer, get lung damage, have to use an oxygen tank, etc.).			.84
I don't want to be smoking when I get older.			.82

Note. Primary loadings are in boldface. For ease of interpretations, loadings < 0.1 are not reported.

Table 3

ARFQ Subscale Score Means and Standard Deviations by Gender.

ARFQ Subscale	Females (N=61)	Males (N=48)
Short-term Consequences	1.73 (1.06)	1.70 (1.02)
Social Disapproval	1.65 (1.05)	1.66 (1.01)
Long-term Concerns [†]	3.15 (1.19)	2.72 (1.24)

Note:

[†] p = .07; Item scoring ranged from 0 (not important) to 4 (extremely important)