Published in final edited form as:
*Psychol Assess*. 2003 June ; 15(2): 163–172.

# Constructing a Short Form of the Smoking Consequences Questionnaire With Adolescents and Young Adults

**Mark G. Myers**
*Psychology Service, Veterans Affairs San Diego Healthcare System, San Diego, California, and Department of Psychiatry, University of California, San Diego*

**Denis M. McCarthy**
*Department of Psychology, University of California, San Diego; Department of Psychological Sciences, University of Missouri—Columbia.*

**Laura MacPherson**
*Joint Doctoral Program in Clinical Psychology, University of California, San Diego, and San Diego State University*

**Sandra A. Brown**
*Psychology Service, Veterans Affairs San Diego Healthcare System and Departments of Psychology and Psychiatry, University of California, San Diego.*

## Abstract

The goal of the present studies was to construct and validate a short form of the 50-item Smoking Consequences Questionnaire (SCQ; T. H. Brandon & T. B. Baker, 1991), a measure of smoking outcome expectancies. In Study 1, a 21-item short form (S-SCQ) was derived from a sample of 107 young adults previously treated for substance abuse. In Study 2, the measure was cross-validated on 125 adolescents in treatment for substance abuse. Confirmatory factor analyses revealed good model fit and factorial invariance for the 4 S-SCQ subscales across both samples. Validation analyses on each sample found that subscale scores generally correlated significantly with smoking-related variables. The present studies provide initial evidence for the utility of the S-SCQ when used with young adults and adolescents.

Substance use outcome expectancies have been found to play a significant role in influencing the course of substance use and abuse (Abrams & Niaura, 1987; Marlatt, 1985). Social-learning-theory-based models of addictive behaviors (Donovan, 1988) posit that outcome expectancies are associated with substance use and mediate the relationship between more distal factors—such as personality, modeling, or affective states—and substance use behavior. Support for the hypothesized role of expectancies in addictive behaviors has derived primarily from research on alcohol use outcome expectancies (Brown, 1985; Brown, Goldman, & Christiansen, 1985; Christiansen, Smith, Roehling, & Goldman, 1989; Stacy, Newcomb, & Bentler, 1991).

Until recently, outcome expectancies for other substances, such as cigarettes, have received substantially less attention. The literature on smoking-related cognitions has primarily focused on tobacco-related attitudes, beliefs, and reasons for smoking, rather than on smoking outcome

Correspondence concerning this article should be addressed to Mark G. Myers, Psychology Service 116B, Veterans Affairs San Diego Healthcare System, 3350 La Jolla Village Drive, San Diego, California 92161. E-mail: mgmyers@ucsd.edu.

These studies were supported in part by Grants AA11155 and AA07033 from the National Institute on Alcohol Abuse and Alcoholism, by Grant DA 09181 from the National Institute on Drug Abuse, and by Grant 7RT-0135 from the California Tobacco Related Disease Research Program. We thank Amy Copeland for her comments on an earlier version of this article.

expectancies specifically (Brandon, Juliano, & Copeland, 1999). Further, a substantial portion of this research has been conducted with ad hoc and unstandardized measures of smoking cognitions (Brandon et al., 1999). Of the limited research that has examined smoking outcome expectancies using validated measures, most has been conducted with college-age youth and adults (Brandon & Baker, 1991; Copeland, Brandon, & Quinn, 1995; Wetter et al., 1994).

Brandon and Baker (1991) made significant progress in the measurement of smoking-related outcome expectancies with the development of the Smoking Consequences Questionnaire (SCQ). The SCQ was initially developed on a college-age sample of smokers and nonsmokers and resulted in a measure with four interpretable factors: Negative Consequences (NC), Negative Reinforcement (NR), Positive Reinforcement (PR), and Appetite-Weight Control (AWC). The SCQ assessed both likelihood (probability) and desirability for each outcome. Results indicated that all positive expectancy factors discriminated among different smoking status groups. However, likelihood ratings were more sensitive than desirability in discriminating among smoking status groups.

Subsequent studies have examined the validity of the SCQ among adult smokers. A study with participants in an efficacy trial for the nicotine patch as an aid to smoking cessation confirmed the original four-factor structure of the SCQ (Wetter et al., 1994). Examination of the predictive utility of the SCQ factors indicated that the expectancy dimensions were significantly related to measures of nicotine withdrawal and cessation success but not to nicotine dependence. More recently, Copeland et al. (1995) investigated alternative factor structures for the SCQ (renamed SCQ-Adult [SCQ-A]) with a sample of severely dependent adult smokers and ex-smokers. Principal-components analyses produced an 8-factor solution for desirability ratings and a 10-factor solution for likelihood (probability) ratings. Significant differences were observed across smoking status groups on all negative smoking outcome expectancy probability subscales and one positive smoking outcome expectancy subscale. Predictive validity analyses of the SCQ-A probability subscales indicated that two positive smoking expectancy subscales (Negative Affect Reduction and Boredom Reduction) predicted smoking rate at different time points. A noteworthy aspect of this study was the identification of a greater number of smoking expectancy factors in this heavier smoking sample, supporting the notion that expectancies become more specific with increased substance use experience (Copeland et al., 1995).

In summary, validation research conducted with the SCQ and SCQ-A in adult samples has found that likelihood ratings of positive and negative smoking outcome expectancies discriminated among smoking status groups. In addition, both positive and negative outcome expectancies predicted smoking variables following cessation treatment.

The goal of the present studies was to construct a short form of the SCQ and to examine the validity of this short form among both young adults and adolescents. The current 50-item version of the SCQ can be unwieldy for younger populations (e.g., adolescents) to complete, especially when it is included as part of a larger battery of measures. Although prior research has examined adolescent smoking expectancies (Bauman & Chenoweth, 1984; Hansen, Collins, Johnson, & Graham, 1985; Stacy et al., 1990; Stacy, Galaif, Sussman, & Dent, 1996), there have been few efforts to develop a standardized expectancy measure for use with adolescents. Further, these prior studies largely focused on smoking uptake (initiation and progression) rather than smoking cessation and persistence. It is currently unknown if the SCQ, which was intended for use with a young adult population (Brandon & Baker, 1991), is an appropriate measure for adolescents. Participants in the present studies were drawn from several investigations of youth with a history of substance abuse, providing a sample with significantly higher rates of smoking than the general population (Myers & Brown, 1994). The first study constructs and validates a short form of the SCQ (S-SCQ) on smoking and nonsmoking young adults, a population in which the full SCQ has demonstrated validity. Cross-

validation of the S-SCQ with smoking and nonsmoking adolescents was conducted in a second study to support broader application of the measure. In addition to psychometric properties of a short-form SCQ, also of interest was the relationship of smoking outcome expectancies with maintenance and cessation of smoking behaviors in adolescents and young adults.

A recent article (Smith, McCarthy, & Anderson, 2000) outlined recommendations for developing short forms of existing instruments and cautioned against the assumption that a shortened form maintains the validity of the long form. The authors recommended a thorough investigation of the validity of the new scale, as well as replication of reliability and validity on a second sample. Following these recommendations, we used a four-step process to develop our short form. First, in Study 1, internal consistency reliability and item analysis of each of the four SCQ subscales was conducted on a sample of young adults who previously attended inpatient treatment for alcohol and other drug (but not tobacco) abuse. We assessed only the likelihood ratings version of the SCQ because previous studies have demonstrated these were more consistently related with smoking behaviors than desirability ratings (Brandon & Baker, 1991; Copeland et al., 1995). The original four-factor structure of the SCQ was retained, as one goal of the present studies was to demonstrate applicability of the S-SCQ to younger smokers who may be less nicotine dependent and may therefore still hold relatively global expectancies. To maintain the established factor structure of the SCQ, we ran analyses separately for each of the four SCQ factors. Items within each factor were retained on the basis of number of items in the original scale, examination of item-total correlations, examination of item-factor loadings, and item content. Confirmatory factor analysis (CFA) was then used to test the factor structure of the abbreviated measure. Both concurrent and predictive validity of the S-SCQ was tested, and reliability and validity measures were compared with those of the full scale. Finally, in Study 2, we cross-validated the measure on a clinical sample of adolescent substance abusers attending inpatient or outpatient treatment for abuse of substances other than tobacco. The factor structure, reliability, and concurrent validity of the scale were evaluated on this second sample, and factor structure was then compared across the two samples.

Study 1: Development of a Short Form of the SCQ in a Young Adult Substance Abuse Population

## Overview

In the first study, a short form of the SCQ was derived in a sample of young adults. Concurrent and predictive validity were assessed for the resulting short-form SCQ.

## Method

### Participants

The first sample consisted of 107 young adult participants in a longitudinal study of outcome following inpatient treatment for adolescent substance abuse. Tobacco use was not addressed by any of the treatment programs from which participants were recruited. SCQ data from the 4-year follow-up interviews for this cohort were used in the present study. Data from this time point were chosen so that the present participants would be comparable in age to participants in the college-age sample on which the original SCQ was developed (Brandon & Baker, 1991). Participants were on average 19.9 years of age (*SD* = 1.3; range = 18-24) at the 4-year follow-up; 41% were female (*n* = 44); and 81% were White, 13% Hispanic, 3% African American, and 3% of other ethnicity. Thirty-one percent of the young adult sample had not finished high school, 36% had graduated from high school, and 33% had some college or vocational school education. Of the full sample from the parent study (*N* = 166), 59 were missing SCQ data and thus were excluded, leaving a final sample of 107 (64% of the full

sample). Participants with missing SCQ data were not different from the included participants on days smoking per month, $t(164) = 1.29$, *ns*; age, $t(164) = 0.50$, *ns*; socioeconomic status score (Hollingshead, 1965), $t(164) = 1.29$, *ns*; gender, $\chi^2(2, N = 166) = 0.07$, *ns*; or ethnicity, $\chi^2(6, N = 166) = 4.52$, *ns*. For the final sample, very few data were missing on individual SCQ items and other study variables (<0.002%). Analyses were conducted by using mean replacement of missing values, with no difference in study results when compared with listwise deletion.

On the basis of the *Diagnostic and Statistical Manual of Mental Disorders* (3rd ed., rev.; *DSM-III-R*; American Psychiatric Association, 1987) diagnostic criteria, 83% of participants were dependent on alcohol, 18% were dependent on marijuana, 13% met criteria for amphetamine dependence, and 5% met criteria for hallucinogen dependence. In the 90 days prior to the baseline interview, participants reported using alcohol on average 9.5 (*SD* = 11.8) days per month, marijuana on 6.6 (*SD* = 10.6) days per month, and other drugs on 2.9 (*SD* = 7.0) days per month.

## Procedure

The young adult participants were initially recruited for participation when they were 14-18 years of age, during the 1st week following entry into treatment. Consent was obtained independently from adolescent participants and their parents. Each participant completed an in-person confidential structured interview during the 2nd or 3rd week of treatment and again at 6 months and 1, 3, 4, and 6 years following discharge. Data for the present study were derived from the 4- and 6-year posttreatment interviews. Over 97% of the original sample was retained at these time points.

## Measures

**Clinical Interview (Brown, Stetson, & Beatty, 1989)—**The Clinical Interview assesses demographics (e.g., age, socioeconomic status, education, family characteristics), treatment history, and psychosocial functioning (e.g., academics, extracurricular activities, social functioning). Demographic variables from this interview were used in the present study.

**SCQ—**This is a 50-item self-report scale designed to measure the subjective expected utility (expectancies) of cigarette smoking. Each smoking consequence item is rated for both likelihood of occurrence (0 = *completely unlikely* to 9 = *completely likely*) and desirability (-5 = *highly undesirable* to 5 = *highly desirable*). Psychometric analyses for the SCQ (Brandon & Baker, 1991) were conducted on 547 college student smokers and nonsmokers (65% female; mean age =18.5 years, *SD* = 2.8). Principal-components analysis of the SCQ was conducted on smokers only ($n = 382$) and yielded four factors (with a total of 50 items) retained on the basis of content analysis and item-factor loadings greater than .5: NC, PR, NR, and AWC. Likelihood scores for each subscale were found to significantly differ across smoking status groups for the original sample ($n = 547$). Subscale reliability was assessed by using a separate sample of 100 college students, and yielded coefficient alpha reliabilities greater than .90 for all four subscales. On the basis of findings that likelihood scores best discriminate smoking status groups (Brandon & Baker, 1991; Copeland et al., 1995), participants in the present study completed only likelihood ratings for the 50 SCQ items.

**Customary Drinking and Drug Use Record (CDDR; Brown et al., 1998)—**The CDDR is a structured interview that assesses alcohol and other drug involvement. For the present study, we used current cigarette smoking variables from the CDDR, including smoking quantity and frequency over the past 90 days, as well as cessation attempts. In addition, we used alcohol and other drug use frequency and dependence criteria from the CDDR administered at the 4- and 6-year follow-up interviews. Reliability and validity of the CDDR

were examined on a sample of 166 adolescents (ages = 14-18, 60% male, 74% White) receiving inpatient treatment for substance abuse and 115 adolescents from the community (ages = 14-18, 45% male, 81% White; Brown et al., 1998). Participants in the validation study completed in-person interviews at baseline and again 6, 12, 24, and 48 months later. Convergence of the CDDR intensity of alcohol and other drug use assessment was examined for the substance-abusing adolescents in relation to a time-line follow-back measure of daily use (Sobell & Sobell, 1992), yielding significant correlations (*r*s = .68-.74). CDDR summary scores for psychological-behavioral dependence were evaluated in relation to the Alcohol Dependence Scale (ADS; Horn, Skinner, Wanberg, & Foster, 1985) and yielded significant correlations for the abusing subsample (*r*s = .56-.57) and community adolescent subsample (*r*s = .24-.79). CDDR assessment of alcohol and other drug use domains for substance abusing youth was internally consistent at both treatment baseline (αs = .72-.94) and at 4 years posttreatment (αs = .63-.90). In addition, test-retest reliabilities calculated by using intraclass correlations for alcohol and other drug variables ranged from .70 to .92.

**Fagerström Test for Nicotine Dependence (FTND; Heatherton, Kozlowski, Frecker, & Fagerström, 1991)—**The FTND, a six-item self-report measure, is a psychometric revision of the eight-item Fagerström Tolerance Questionnaire (FTQ; Fagerström, 1978). The FTND is a continuous scale of nicotine dependence, with scores ranging from 0 to 10 (0-2 = no nicotine dependence, 3-5 = moderate nicotine dependence, and 6-10 = substantial nicotine dependence). The FTQ was designed as a test of physical dependence on nicotine, is commonly used in clinical settings, and has been used to select the best candidates for nicotine replacement therapy among adults (Heatherton et al., 1991). The revision study was conducted on 254 smokers, 17-77 years old, 44% of whom were male. Comparisons of several different item and scoring combinations in relation to biochemical measures of smoking (expired carbon monoxide and serum cotinine levels), along with consideration of item content, resulted in retention of the six-item FTND. Regression analyses demonstrated that the FTND scale explained 28% of the variance in carbon monoxide readings and 21% of variance in salivary cotinine levels. Further analyses indicated that the scale was composed of a single factor (lowest loading = .23) and had an internal consistency (Cronbach's α) of .61, which reflected a significant improvement over the FTQ.

## CFAs

We conducted all CFAs by using Mplus software (Muthen & Muthen, 1999) with maximum-likelihood estimation. Model fit was evaluated by examining fit indicators and cutoffs suggested by Vandenberg and Lance (2000), including the comparative fit index (CFI; Bentler, 1990), the Tucker-Lewis Index (TLI; Tucker & Lewis, 1973), and the standardized root-mean-square residual (SRMSR). CFI and TLI values near .95 or greater are considered indicative of a good fitting model (Vandenberg & Lance, 2000). The SRMSR is a measure of the size of the average residual (error) involved in estimating the model, with lower values indicating better fit (less error). SRMSR values close to .08 or less are considered indicative of good fit (Vandenberg & Lance, 2000).

Rules of thumb regarding sample size in CFA focus on a subjects-to-variable ratio of 4:1 or 5:1 (Floyd & Widaman, 1995). However, recent research (MacCallum, Widaman, Zhang, & Hong, 1999; Marsh, Hau, Balla, & Grayson, 1998) indicates that with a higher number of indicators per factor (>4) and high levels of communalities (>.60), sample sizes of 100 are adequate for proper CFAs.

# Results

## Participant Cigarette Use

Seventy-six percent (81/107) of participants in the sample were classified as smokers on the basis of smoking at least once per month in the prior 3 months. Fifty-eight percent of the 107 participants reported smoking daily. On average, the young adult smokers ($n$ = 81) consumed 14.7 ($SD$ = 6.9) cigarettes per day, smoked 23.9 ($SD$ = 10.5) days per month, reported 2.8 ($SD$ = 3.4) cessation attempts, and obtained a score of 4.4 ($SD$ = 2.1) on the FTND, indicating moderate nicotine dependence.

## Reliability and Item Analysis

Decisions regarding item retention were based on the number of items in the original subscale, examination of item-total correlations, examination of item-factor loadings, results of CFAs, and item content. Cutoff values were determined independently for each subscale, with the goals of producing shortened subscales with acceptable reliability and preservation of original subscale content.

Item analysis of the 18 NC items indicated that 10 items had an item-total correlation over .50. A factor analysis indicated that 4 of these items had a factor loading above .60. To better represent item content of the original NC subscale, we examined factor structure with additional items. However, inclusion of items other than the 4 that loaded above .60 resulted in poor model fit. Thus, only 4 items were retained for the abbreviated subscale. Coefficient alpha for the shortened subscale was acceptable (.79), although lower than that of the full NC subscale (.88). A CFA of these 4 items indicated excellent fit for a one-factor model, $\chi^2(2, N = 107) = 0.43$, CFI = 1.00, TLI = 1.00, SRMSR = .01.

For the PR subscale, item analysis indicated that 12 of the 15 items had item-total correlations over .70. Factor analysis results indicated that 5 of these items had loadings over .70. These 5 items were retained for the abbreviated subscale. Coefficient alpha for the shortened subscale was high (.94) and comparable to the full PR subscale (.95). A CFA of the shortened subscale indicated excellent fit for a one-factor model, $\chi^2(5, N = 107) = 7.51$, CFI = .99, TLI = .99, SRMSR = .02.

For the NR subscale, item analysis indicated that 7 of the 12 items had item-total correlations over .80. Factor analysis results indicated that all 7 of these items had factor loadings over .80 and were thus retained for the abbreviated subscale. Coefficient alpha for the shortened subscale was high (.95) and comparable to the full NR subscale (.96). A CFA of the shortened subscale indicated good fit for a one-factor model, $\chi^2(14, N = 107) = 83.16$, CFI = .91, TLI = .89, SRMSR = .05.

As the original AWC factor included only five items, a decision was made not to reduce this subscale in order to preserve the factor structure of the full SCQ. All item-total correlations and the coefficient alpha for the subscale were high (.93). A CFA indicated that all factor loadings were over .70, and a one-factor model fit very well, $\chi^2(5, N = 107) = 13.85$, CFI = .98, TLI = .96, SRMSR = .03.

The total S-SCQ consisted of 21 items (see Table 1). Coefficient alpha for the total scale was high (.93), a slight reduction from the full scale (.96). A CFA was used to test the four-factor structure of the S-SCQ in the young adult sample. This analysis indicated good fit for the model: S-SCQ, $\chi^2(183, N = 107) = 338.12$, CFI = .92, TLI = .92, SRMSR = .08. Table 1 presents the factor loadings; Table 2, the subscale mean scores; and Table 3, the factor inter-correlations of the four-factor model of the S-SCQ.

The S-SCQ correlated highly with the full SCQ ($r$ = .94, $p$ < .01) in the young adult sample. Each of the individual subscales of the S-SCQ also correlated well with the full version (NC: $r$ = .78, PR: $r$ = .86, NR: $r$ = .99, all $p$s < .01).

### Concurrent and Predictive Validity of the S-SCQ

Table 4 presents the correlations of both the S-SCQ and the full SCQ with concurrent measures of smoking behavior and nicotine dependence. The PR, NR, and AWC factors in both versions correlated with number of cigarettes smoked per day, number of days smoking per month, and FTND scale score. Neither the S-SCQ nor the full SCQ scale was related to number of quit attempts. The NC subscale of both versions did not significantly correlate with any concurrent measures of smoking.

Cross-time correlations of both the S-SCQ and the full SCQ scales with smoking behavior and nicotine dependence (number of cigarettes smoked per day, number of days smoking per month, and FTND scale score) 2 years later were also examined. The PR, NR, and AWC factors, as well as the full scale of both the short and long forms, were significantly correlated with days smoking per month (PR: $r$s = .37, .47; NR: $r$s = .49, .48; AWC: $r$s = .24, .24; Full Scale: $r$s = .46, .43; all $p$s < .01). Although not correlated with any of the concurrent validation variables, the NC factor (of both the short and full SCQ) was the only subscale correlated with number of cigarettes per day 2 years later ($r$s =-.37,-.40 respectively, $p$s < .01). None of the subscales were significantly correlated with FTND scores 2 years later.

Study 2: Cross-Validation of the S-SCQ in an Adolescent Substance Use Population

## Overview

The second study consisted of a cross-validation of the S-SCQ on a sample of adolescents treated for substance abuse. CFAs were used to assess model fit, and validation analyses were conducted.

## Method

### Participants

The second sample consisted of 125 adolescents drawn from three independent studies of adolescent substance abuse. None of the treatment programs from which participants were recruited addressed tobacco use. The participants were on average 15.9 years of age ($SD$ = 1.2; range = 13-19); 61 (49%) were girls; and 71% were White, 18% Hispanic, 4% Asian American, and 7% of other ethnicity. Included in the present sample were 68 adolescent participants in a study of outcome following inpatient substance abuse treatment, 15 participants in a smoking cessation treatment development study for adolescents receiving outpatient substance abuse treatment, and 42 participants in a treatment outcome study of a smoking cessation intervention for adolescents receiving outpatient substance abuse treatment. For both of the smoking cessation treatment studies, the intervention was embedded within the outpatient treatment programs, and all smokers were required to attend; thus, these participants were not self-selected on the basis of a desire to quit smoking. The total sample size for these three studies was 183, of which 58 participants (32%) were missing SCQ data, resulting in the final sample of 125 examined in the present study. Participants with missing data were not different from the full sample in days smoking per month, $t(181) = 1.11$, *ns*; cigarettes per day, $t(180) = 0.26$, *ns*; age, $t(181) = -0.14$, *ns*; gender, $\chi^2(2, N = 183) = 0.25$, *ns*; or ethnicity, $\chi^2(6, N = 183) = 0.66$, *ns*. For the final sample, very few data were missing on individual SCQ items and other study variables (<0.002%). Analyses were conducted by using mean replacement of missing values, with no difference in study results when compared with analyses using listwise deletion.

On the basis of *DSM-III-R* diagnostic criteria, 68% of participants were dependent on alcohol, 81% on marijuana, 45% on amphetamines, and 24% on hallucinogens. In the 90 days prior to the baseline interview, participants reported using alcohol on average 8.7 (*SD* = 12.7) days per month, marijuana on 11.4 (*SD* = 12.0) days per month, and other drugs 7.8 (*SD* = 11.8) days per month. The young adult sample from Study 1 (*n* = 107; see above) was used in analyses examining factor invariance across the samples.

### Procedure

Participants were initially recruited for participation following entry into substance abuse treatment. Consent was obtained independently from adolescent participants and their parents. Each participant completed an in-person confidential structured interview within 2 weeks after obtaining consent for participation.

### Measures

As described in the first study, data used in the present study were derived from the Clinical Interview, the SCQ, and the CDDR. Because the FTQ and the FTND have not been evaluated for adolescent smokers, participants completed the original FTQ items, which were then scored on the basis of criteria devised for the modified FTQ (mFTQ; Prokhorov, Pallonen, Fava, & Ding, 1996). The mFTQ was based on the FTQ and was adapted for use with adolescents. It includes seven of the eight original FTQ items and is scored from 0 to 9, with scores of 0-2 reflecting no nicotine dependence, scores of 3-5 indicating moderate nicotine dependence, and scores of 6-9 indicating substantial nicotine dependence. A validation study (Prokhorov et al., 1996) conducted with 110 vocational-technical high school students (average age = 17 years, 52% male, 88% White) indicated that the subscale was composed of a single component, with item loadings ranging from .45 to .75 and internal consistency (Cronbach's α) of .75. Convergent validation was demonstrated with significant correlations between mFTQ total score and smoking duration (*r* = .36) and intensity (*r* = .45). Internal consistency (Cronbach's α) for the mFTQ in the present sample was .70.

As in Study 1, participants completed the original 50-item likelihood score version of the SCQ. All data for the present study were derived from baseline interviews, prior to initiation of the smoking treatment for the participants in the adolescent smoking cessation protocols.

### CFAs

Analytic procedures for CFA were identical to those used in Study 1.

## Results

### Participant Cigarette Use

Ninety-three percent (116/125) of participants in the adolescent sample were classified as current smokers (having smoked at least once in the previous month). Adolescent smokers (*n* = 116) reported smoking on average 13.0 (*SD* = 11.7) cigarettes per day and 26.5 (*SD* = 7.3) days per month. The smokers reported an average of 1.7 (*SD* = 2.8) lifetime cessation attempts and a mean score of 3.5 (*SD* = 2.4) on the mFTQ, indicating moderate nicotine dependence. Sixty percent of the 125 participants were daily smokers.

### Cross-Validation of the S-SCQ

The 21 items retained for the S-SCQ in Study 1 were tested in a sample of adolescents in treatment for substance abuse. Internal consistency reliability and CFA results for each factor and for the total scale are presented in Table 5. These results indicated high internal consistency and excellent fit for each of the individual subscales and for the four-factor model of the full

scale. The S-SCQ correlated highly with the full SCQ scale ($r = .96$, $p < .01$) in the adolescent sample. Each of the individual subscales of the S-SCQ again correlated well with the full version (NC: $r = .68$, PR: $r = .86$, NR: $r = .99$, all $p$s $< .01$).

Invariance testing was then used to compare the factor structure of the S-SCQ across the young adult and adolescent samples. Factorial invariance is tested by comparing a model that constrains factor loadings to be equal across the two groups with a model without such constraints. A nonsignificant change in the chi-square when the constraints are added indicates that the factor loadings are roughly equivalent for the two groups and therefore that the factor structure is the same across the two groups. The two-group model with no constraints fit the data very well, $\chi^2(366, N = 125) = 637.35$, CFI = .93, TLI = .92, SRMSR = .08. Specifying that factor loadings were equal across the two groups did not result in a significant drop in fit, $\chi^2$ difference $(17, N = 125) = 12.73$, CFI = .93, TLI = .93, SRMSR = .08. These results indicated that the four-factor structure of the S-SCQ was equivalent across groups. Factor loadings of each item for both samples are presented in Table 1.

Table 6 presents correlations of the S-SCQ and the full SCQ with concurrent measures of smoking behavior and nicotine dependence. The full scale score of both the S-SCQ and the full SCQ correlated with number of cigarettes smoked per week, number of days smoking per month, FTND scale score, and number of quit attempts. Fit indices for each S-SCQ factor (Table 5) and the full four-factor S-SCQ, $\chi^2(183, N = 125) = 299.23$, CFI = .94, TLI = .93, SRMSR = .07, indicated good to excellent model fit.

## Discussion

The present studies examined the derivation, structure, and psychometric characteristics of the S-SCQ in a young adult and an adolescent sample. In Study 1, reliability and validity were demonstrated among young adults for a short form that contained 21 items representing the four original SCQ factors. In Study 2, cross-validation and invariance testing indicated that the S-SCQ is appropriate for use with adolescents and young adults.

Findings largely supported the concurrent and predictive validity of the revised SCQ subscales among young adults. However, in contrast with the original SCQ validation study (Brandon & Baker, 1991), neither the original nor the short NC subscale correlated significantly with any of the concurrent validation variables in the present study. This finding may reflect that the present study included a higher percentage of current smokers (76%) and examined subscale scores in relation to continuous variables of smoking behavior, whereas the original SCQ validation study sample included 61% current smokers and compared scores across smoking status categories. Another possibility is that this discrepancy reflects the relatively restricted range of the NC subscale in this sample, indicating that most participants had high expectations of negative consequences from smoking regardless of current smoking behavior. In contrast with concurrent validity results, higher scores on the NC factor predicted lower smoking quantity 2 years later. This finding suggests that high expectancies of negative consequences may not influence current smoking but ultimately may function to motivate future changes in smoking behavior of young adults.

For the adolescent sample, the NR and PR subscales were significantly correlated with all concurrent smoking variables, but few significant correlations emerged for the NC and AWC subscales. For the adolescent sample, the full-scale score of the NC factor correlated significantly with smoking frequency, whereas the short subscale NC score did not. This discrepancy may reflect that the reduced NC subscale was composed primarily of items describing long-term global health consequences, whereas the original subscale included a range of items representing more specific and immediate negative consequences (e.g., “I look ridiculous while smoking”). In our analyses of the original NC subscale items, inclusion of

additional items (beyond the four retained) resulted in poor model fit, suggesting that these items may represent multiple factors rather than a unitary subscale. This interpretation is supported by findings from a principal-components analysis of SCQ items with adult heavy smokers (Copeland et al., 1995) that yielded four negative consequence subscales (Health Risk, Craving/Addiction, Negative Physical Feelings, and Negative Social Impression). In addition, several authors have suggested that consequences perceived as personally relevant are of particular importance in motivating behavior (e.g., DiClemente, 1991). Thus, the observed lack of relationship between the revised NC subscale expectancies and smoking behaviors may indicate that adolescent participants did not perceive the long-term health risks from smoking as personally meaningful. This finding suggests the importance of including items that reflect more immediate and personally relevant consequences when measuring adolescent expectancies for negative consequences from smoking.

In contrast with what we found in the young adult sample, only one of the adolescent validation variables (smoking quantity) correlated significantly, if modestly, with the AWC subscale scores. Because scores on the AWC subscale were comparable across the samples, it may be that the relationship between weight-control-related expectancies and smoking behavior changes over the course of development and/or smoking progression. However, this seems unlikely, given that prior research indicates that smoking-related weight control beliefs were significantly associated with adolescent smoking (Hine, McKenzie-Richer, Lewko, Tilleczek, & Perreault, 2002), especially among girls (Boles & Johnson, 2001). These previous studies support the inclusion of weight control as an important dimension of adolescent smoking-related expectancies; however, further research is needed to evaluate the utility of the AWC subscale for adolescents.

The present studies demonstrated that the factor structure of the S-SCQ was reliable within and across the young adult and adolescent samples. These findings are consistent with evidence from the alcohol literature suggesting that although expectancies become better defined with greater alcohol experience, factor content of outcome expectancy scales is relatively stable across experience and age (Christiansen, Goldman, & Inn, 1982; Wiers, Hoogeveen, Sergeant, & Gunning, 1997). In addition, studies of alcohol expectancies have demonstrated that levels of positive expectancies increase through adolescence (Christiansen et al., 1982) but level off and possibly decline in young adulthood as alcohol use stabilizes (Sher, Wood, Wood, & Raskin, 1996). The pattern of findings for positive expectancy scores in the present study, whereby adolescents had higher positive expectancies for smoking than did the young adults, can be interpreted as consistent with the literature on development of alcohol-related expectancies, given the greater prevalence of smoking within the adolescent sample (93% vs. 77%). As such, the present studies provide initial evidence for the appropriateness of this measure for use with both adolescents and young adults.

This investigation relied on samples of youth with a history of substance abuse treatment, and as such the generalizability of the present findings remains to be established. Nonetheless, given the strong correlation between cigarette smoking and use of other substances in the general adolescent population (Johnston, O'Malley, & Bachman, 1992; Nelson et al., 1995), we expect that utility of the S-SCQ is likely to extend to the broader population of heavy-smoking adolescents. At the present time, it is unknown whether treatment for alcohol and other drug abuse influences expectancies for tobacco use (a substance that was not addressed in treatment received by participants in the present study). Emerging evidence suggests that interventions designed to specifically challenge substance use expectancies may lead to short-term changes in expected effects of the targeted substance (Darkes & Goldman, 1998). Whether such treatment may alter expectancies (or behaviors) for substances such as tobacco that were not specifically targeted remains to be investigated in future studies. However, the substantial persistence of smoking following adolescent substance abuse treatment (Myers & Brown,

1994, 1997) suggests such treatment had little effect on tobacco use. The present studies used a limited range of validation variables, suggesting the need for further validation studies. An area of particular interest would be to demonstrate the utility of this measure as a predictor of youth smoking intervention outcomes. Another limitation of the present studies is that items for the original SCQ were derived from young adults and as such may have failed to capture expectancies specific to adolescents. For example, although the reduced factors generally showed good concurrent validity, item content of the NC subscale may require modification to better represent adolescent-specific expectancies. Finally, only likelihood ratings were assessed for smoking expectancies in the present study. Generally, studies have demonstrated that likelihood ratings have greater predictive and discriminative utility than desirability ratings (Brandon & Baker, 1991; Copeland et al., 1995). Yet, a recent investigation with adult smokers (Copeland & Brandon, 2002) found that although desirability ratings did not uniquely account for significant variance, they did moderate the relationship between likelihood ratings and smoking-related variables. These findings suggest that future studies may benefit from assessing likelihood and desirability ratings and their interaction when examining smoking outcome expectancies.

Given the relatively small samples and preponderance of current smokers in the present studies, expectancies were not evaluated across different levels of smoking or across gender, issues that should be addressed in future investigations of the S-SCQ. Further psychometric studies with larger, more representative samples are also needed to demonstrate comparable psychometric properties for the S-SCQ administered in its current form and to provide evidence for test-retest reliability of the S-SCQ, as well as evidence of predictive utility among adolescents. It is also important to note that correlations of the short and full subscales are overestimated because of nonindependent administration. On the basis of available recommendations for creating short forms of existing measures, future studies should evaluate the psychometric characteristics of the S-SCQ based on administration of only the short form, not the full measure as was the case in the present studies. Finally, cross-cultural studies are also needed to establish whether cigarette smoking expectancies as assessed by the S-SCQ are similar across ethnic groups.

The present studies provide initial evidence for the utility of the S-SCQ, a short-form measure of cigarette-smoking-related expectancies, when used with young adults and adolescents. To our knowledge this represents the first examination of the SCQ among adolescents, a population that has recently received a great deal of attention in cigarette-smoking-related research but for which few smoking-related measures have been adequately evaluated. The content of the shortened subscales is consistent with the original subscales and results in a significantly briefer measure with good psychometric characteristics. Brandon et al. (1999) have stressed the importance of integrating smoking expectancies into larger and more complex predictive models. A brief, validated measure of smoking expectancies can facilitate such research, easing both the administration and analyses of smoking expectancies in larger models.

## References

Abrams, DB.; Niaura, RS. Social learning theory. In: Blane, HT.; Leonard, KE., editors. Psychological theories of drinking and alcoholism. Guilford Press; New York: 1987. p. 181-226.

American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 3rd ed., rev.. Author; Washington, DC: 1987.

Bauman KE, Chenoweth RL. The relationship between the consequences adolescents expect from smoking and their behavior: A factor analysis with panel data. Journal of Applied Social Psychology 1984;14:28–41.

Bentler PM. Comparative fix indexes in structural models. Psychological Bulletin 1990;107:238–246. [PubMed: 2320703]

Boles SM, Johnson PB. Gender, weight concerns, and adolescent smoking. Journal of Addictive Diseases 2001;20:5–14. [PubMed: 11318397]

Brandon TH, Baker TB. The Smoking Consequences Questionnaire: The subjective expected utility of smoking in college students. Psychological Assessment: A Journal of Consulting and Clinical Psychology 1991;3:484–491.

Brandon, TH.; Juliano, LM.; Copeland, AL. Expectancies for tobacco smoking. In: Kirsch, I., editor. How expectancies shape experience. American Psychological Association; Washington, DC: 1999. p. 263-299.

Brown SA. Expectancies versus background in the prediction of college drinking patterns. Journal of Consulting and Clinical Psychology 1985;53:123–130. [PubMed: 3980817]

Brown SA, Goldman MS, Christiansen BA. Do alcohol expectancies mediate drinking patterns of adults? Journal of Consulting and Clinical Psychology 1985;53:512–519. [PubMed: 4031207]

Brown SA, Myers MG, Lippke L, Tapert SF, Stewart DG, Vik PW. Psychometric evaluation of the Customary Drinking and Drug Use Record (CDDR): A measure of adolescent alcohol and drug involvement. Journal of Studies on Alcohol 1998;59:427–438. [PubMed: 9647425]

Brown SA, Stetson BA, Beatty PA. Cognitive and behavioral features of adolescent coping in high-risk drinking situations. Addictive Behaviors 1989;14:43–52. [PubMed: 2718823]

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]

Christiansen BA, Smith GT, Roehling PV, Goldman MS. Using alcohol expectancies to predict adolescent drinking behavior after one year. Journal of Consulting and Clinical Psychology 1989;57:93–99. [PubMed: 2925979]

Copeland AL, Brandon TH. Do desirability ratings moderate the validity of probability ratings on the Smoking Consequences Questionnaire? Psychological Assessment 2002;14:353–359. [PubMed: 12214441]

Copeland AL, Brandon TH, Quinn EP. The Smoking Consequences Questionnaire-Adult: Measurement of smoking outcome expectancies of experienced smokers. Psychological Assessment 1995;7:484–494.

Darkes J, Goldman MS. Expectancy challenge and drinking reduction: Process and structure in the alcohol expectancy network. Experimental and Clinical Psychopharmacology 1998;6:64–76. [PubMed: 9526147]

DiClemente, CC. Motivational interviewing and the stages of change. In: Miller, WR.; Rollnick, S., editors. Motivational interviewing. Guilford Press; New York: 1991. p. 191-202.

Donovan, DM. Assessment of addictive behaviors: Implications of an emerging biopsychosocial model. In: Donovan, DM.; Marlatt, GA., editors. Assessment of addictive behaviors. Guilford Press; New York: 1988. p. 3-48.

Fagerström KO. Measuring degree of physical dependence to tobacco smoking with reference to individualization of treatment. Addictive Behaviors 1978;14:365–378.

Floyd FJ, Widaman KF. Factor analysis in the development and refinement of clinical assessment instruments. Psychological Assessment 1995;7:286–299.

Hansen WB, Collins LM, Johnson CA, Graham JW. Self-initiated smoking cessation among high school students. Addictive Behaviors 1985;10:265–271. [PubMed: 4083103]

Heatherton TF, Kozlowski LT, Frecker RC, Fagerström KO. The Fagerström Test for nicotine dependence: A revision of the Fagerström Tolerance Questionnaire. British Journal of Addiction 1991;86:1119–1127. [PubMed: 1932883]

Hine DW, McKenzie-Richer A, Lewko J, Tilleczek K, Perreault L. A comparison of the mediational properties of four adolescent smoking expectancy measures. Psychology of Addictive Behaviors 2002;16:187–195. [PubMed: 12236453]

Hollingshead, AB. Two-factor index of social position. Yale University Press; New Haven, CT: 1965.

Horn, JL.; Skinner, HA.; Wanberg, KW.; Foster, FM. Alcohol Dependence Scale. Addiction Research Foundation; Toronto, Ontario, Canada: 1985.

Johnston, LD.; O'Malley, PM.; Bachman, JG. Smoking, drinking, and illicit drug use among American secondary school students, college students, and young adults, 1975-1991: Vol. I. Secondary school

students. U.S. Department of Health and Human Services, Public Health Service, National Institutes of Health, National Institute on Drug Abuse; Bethesda, MD: 1992. (NIH Publication No. 93-3480).

MacCallum RC, Widaman KF, Zhang S, Hong S. Sample size in factor analysis. Psychological Methods 1999;4:84–99.

Marlatt, GA. Cognitive factors in the relapse process. In: Marlatt, GA.; Gordon, JR., editors. Relapse prevention. Guilford Press; New York: 1985. p. 128-200.

Marsh HW, Hau K-T, Balla JR, Grayson D. Is more ever too much? The number of indicators per factor in CFA. Multivariate Behavioral Research 1998;33:181–220.

Muthen, BO.; Muthen, LK. Mplus (Version 2.12) [Computer software]. Los Angeles: 1999. StatModel.com.

Myers MG, Brown SA. Smoking and health in substance abusing adolescents: A two-year follow-up. Pediatrics 1994;93:561–566. [PubMed: 8134209]

Myers MG, Brown SA. Cigarette smoking four years following treatment for adolescent substance abuse. Journal of Child and Adolescent Substance Abuse 1997;7:1–15.

Nelson DE, Giovino GA, Shopland DR, Mowery PD, Mills SL, Eriksen MP. Trends in cigarette smoking among U.S. adolescents, 1974 through 1991. American Journal of Public Health 1995;85:34–40. [PubMed: 7832259]

Prokhorov AV, Pallonen UE, Fava JL, Ding L. Measuring nicotine dependence among high-risk adolescent smokers. Addictive Behaviors 1996;21:117–127. [PubMed: 8729713]

Sher KJ, Wood MD, Wood PK, Raskin G. Alcohol outcome expectancies and alcohol use: A latent variable cross-lagged panel study. Journal of Abnormal Psychology 1996;105:561–574. [PubMed: 8952189]

Smith GT, McCarthy DM, Anderson KG. On the sins of short-form development. Psychological Assessment 2000;12:102–111. [PubMed: 10752369]

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. Pergamon Press; Totowa, NJ: 1992. p. 73-98.

Stacy AW, Dent CW, Sussman S, Raynor A, Burton D, Flay BR. Expectancy accessibility and the influence of outcome expectancies on adolescent smokeless tobacco use. Journal of Applied Social Psychology 1990;20(10 Pt 1):802–817.

Stacy AW, Galaif ER, Sussman S, Dent CW. Self-generated drug outcomes in high-risk adolescents. Psychology of Addictive Behaviors 1996;10:18–27.

Stacy AW, Newcomb MD, Bentler PM. Personality, problem drinking, and drunk driving: Mediating, moderating, and direct-effect models. Journal of Personality and Social Psychology 1991;60:795–811. [PubMed: 2072256]

Tucker LR, Lewis C. A reliability coefficient for maximum likelihood factor analysis. Psychometrika 1973;38:1–10.

Vandenberg RJ, Lance CE. A review and synthesis of the measurement invariance literature: Suggestions, practices, and recommendations for organizational research. Organizational Research Methods 2000;3:4–69.

Wetter DW, Smith SS, Kenford SL, Jorenby DE, Fiore MC, Hurt RD, et al. Smoking outcome expectancies: Factor structure, predictive validity, and discriminant validity. Journal of Abnormal Psychology 1994;103:801–811. [PubMed: 7822583]

Wiers RW, Hoogeveen K-J, Sergeant JA, Gunning WB. High- and low-dose alcohol-related expectancies and the differential associations with drinking in male and female adolescents and young adults. Addiction 1997;92:871–888. [PubMed: 9293046]

**Table 1**

Factor Loadings of Short-Form Smoking Consequences Questionnaire Items for the Young Adult and Adolescent Samples

| Factor and item | Young adults (*n* = 107) | Adolescents (*n* = 125) |
|---|---|---|
| Factor 1: Negative Consequences | | |
| 1. Smoking is taking years off my life. | .51 | .63 |
| 2. Smoking is hazardous to my health. | .67 | .77 |
| 3. The more I smoke, the more I risk my health. | .96 | .87 |
| 4. By smoking I risk heart disease and lung cancer. | .74 | .85 |
| Factor 2: Positive Reinforcement | | |
| 1. Cigarettes taste good. | .89 | .87 |
| 2. I enjoy the taste sensations while smoking. | .95 | .88 |
| 3. When I smoke, the taste is pleasant. | .97 | .83 |
| 4. I will enjoy the flavor of a cigarette. | .90 | .82 |
| 5. I enjoy feeling a cigarette on my tongue and lips. | .72 | .69 |
| Factor 3: Negative Reinforcement | | |
| 1. When I'm angry a cigarette can calm me down. | .86 | .83 |
| 2. Cigarettes help me deal with anger. | .82 | .84 |
| 3. Cigarettes help me deal with anxiety or worry. | .85 | .81 |
| 4. Smoking calms me down when I feel nervous. | .86 | .89 |
| 5. Smoking helps me deal with depression. | .82 | .75 |
| 6. Cigarettes help me reduce or handle tension. | .92 | .94 |
| 7. When I'm upset with someone, a cigarette helps me cope. | .93 | .88 |
| Factor 4: Appetite-Weight Control | | |
| 1. Smoking helps me control my weight. | .72 | .74 |
| 2. Smoking keeps my weight down. | .85 | .90 |
| 3. Cigarettes keep me from eating more than I should. | .89 | .85 |
| 4. Smoking controls my appetite. | .89 | .91 |
| 5. Cigarettes keep me from overeating. | .92 | .84 |

*Note*. The Smoking Consequences Questionnaire items are from "The Smoking Consequences Questionnaire: The Subjective Expected Utility of Smoking in College Students," by T. H. Brandon and T. B. Baker, 1991, *Psychological Assessment: A Journal of Consulting and Clinical Psychology, 3*, p. 491. Copyright 1991 by the American Psychological Association. Reprinted with permission of the author.

**Table 2**

Short-Form Smoking Consequences Questionnaire Subscale Means and Standard Deviations in the Young Adult and Adolescent Samples

| Subscale | Young adults (*n* = 107) | | Adolescents (*n* = 125) | |
|---|---|---|---|---|
| | M | SD | M | SD |
| Negative Consequences | 31.31 | 6.87 | 30.57 | 7.37 |
| Positive Reinforcement | 31.76 | 18.39 | 42.36 | 18.40 |
| Negative Reinforcement | 20.37 | 13.36 | 27.34 | 13.48 |
| Appetite-Weight Control | 16.44 | 12.29 | 16.06 | 14.17 |
| Total | 99.88 | 37.36 | 116.33 | 38.83 |

**Table 3**

Intercorrelations of Short-Form Smoking Consequences Questionnaire Factors in the Young Adult (n = 107) and Adolescent (n = 125) Samples

| Factor | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| 1. Negative Consequences | — | | | |
| 2. Negative Reinforcement | .08/.04 | — | | |
| 3. Positive Reinforcement | .12/.15 | .56/.53**** | — | |
| 4. Appetite-Weight Control | .02/.09 | .24/.36**** | .53/.49**** | — |

*Note*.Correlations are presented as young adult/adolescent.

** $p < .01$.

**Table 4**

Concurrent Correlations Between Short-Form SCQ and Full SCQ Factors and Smoking Behaviors in the Young Adult Sample (n = 107)

| Factor and SCQ form | Cigs/day | Days/mo. | Quit attempts | FTND score |
|---|---|---|---|---|
| Negative Consequences | | | | |
| Short form | .12 | -.11 | .09 | .01 |
| Long form | .01 | -.13 | .09 | -.02 |
| Positive Reinforcement | | | | |
| Short form | .45** | .45** | .13 | .46** |
| Long form | .46** | .46** | .12 | .48** |
| Negative Reinforcement | | | | |
| Short form | .47** | .35** | .09 | .49** |
| Long form | .56** | .46** | .09 | .57** |
| Appetite-Weight Control | .24** | .25** | .08 | .31** |
| Total score | | | | |
| Short form | .50** | .42** | .14 | .52** |
| Long form | .47** | .38** | .12 | .48** |

*Note.* SCQ = Smoking Consequences Questionnaire; Cigs = cigarettes; mo. = month; FTND = Fagerström Test for Nicotine Dependence.

** $p < .01$.

**Table 5**

Internal Consistency and Confirmatory Factor Analysis Results for the Short-SCQ in the Adolescent Sample (n = 125)

| Statistic | Negative Consequences | Negative Reinforcement | Positive Reinforcement | Appetite-Weight Control |
|---|---|---|---|---|
| Full SCQ α | .84 | .92 | .96 | .93 |
| Short-SCQ α | .84 | .92 | .95 | .93 |
| $\chi^2$ (*df*)[a] | 5.72 (2) | 15.57 (5) | 27.14 (14) | 15.74 (5) |
| CFI | .98 | .97 | .99 | .98 |
| TLI | .95 | .94 | .98 | .96 |
| SRMSR | .03 | .03 | .08 | .02 |

*Note.* Short-SCQ = short form of the Smoking Consequences Questionnaire; CFI = comparative fit index; TLI = Tucker-Lewis Index; SRMSR = standardized root-mean-square residual.

[a] $N = 125$.

**Table 6**

Concurrent Correlations Between Short-Form SCQ and Full SCQ Factors and Smoking Behaviors in the Adolescent Sample (n = 125)

| Factor and SCQ form | Cigs/day | Days/mo. | Quit attempts | mFTQ score |
|---|---|---|---|---|
| Negative Consequences | | | | |
| Short form | -.04 | -.13 | .10 | -.02 |
| Long form | -.11 | -.31** | .15* | -.19* |
| Positive Reinforcement | | | | |
| Short form | .32** | .42** | .22** | .35** |
| Long form | .34** | .43** | .20* | .35** |
| Negative Reinforcement | | | | |
| Short form | .31** | .43** | .21* | .31* |
| Long form | .30** | .46** | .24** | .36** |
| Appetite-Weight Control | .18* | .00 | .11 | .04 |
| Total score | | | | |
| Short form | .32** | .32** | .23** | .28** |
| Long form | .25** | .25** | .24** | .23** |

*Note.*SCQ = Smoking Consequences Questionnaire; Cigs = cigarettes; mo. = month; mFTQ = modified Fagerström Tolerance Questionnaire.

* $p < .05$.

** $p < .01$.