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Additional Validity Evidence for the PROMIS Smoking Assessment Toolkit

Maria O. Edelen, PhD, Wenjing Huang, PhD, and Brian D. Stucky, PhD

Abstract

Introduction—The Patient Reported Outcomes Measurement Information System (PROMIS®) Smoking Initiative has developed six item banks for assessing smoking behaviors and biopsychosocial correlates of smoking among daily and nondaily adult cigarette smokers. This paper presents new validity evidence for the item banks including correlations of the item banks to the existing legacy measures of smoking (Fagerström Test of Nicotine Dependence (FTND), Questionnaire of Smoking Urges (QSU), and the Wisconsin Inventory of Smoking Dependence Motives (WISDM)).

Methods—Using data from a follow-up sample ($N=491$) and a community sample ($N=369$) of adult daily and nondaily smokers, we replicated the findings from Edelen et al. (2014a) and examined the correlations of legacy smoking measures with the new item bank scores.

Results—Preliminary validity findings were largely replicated with the new data. Correlations among the banks are moderate and bank score associations with measures of smoking behavior, quitting history, and other PROMIS measures follow expected patterns (e.g., nicotine dependence is most strongly associated with smoking quantity and time to first cigarette of the day; health and psychosocial expectancies are most related to quitting recency and interest). Correlations of bank scores with legacy measures are moderate to strong. The PROMIS nicotine dependence scores were most strongly associated with the legacy instruments.

Conclusions—These analyses provide strong evidence for the validity of the PROMIS Smoking item banks in two independent samples.

As part of the Patient Reported Outcomes Measurement Information System (PROMIS®) effort, the *PROMIS Smoking Initiative* (Shadel, Edelen & Tucker, 2011) has developed an assessment toolkit for current adult cigarette smokers that enables efficient measurement of six constructs of central importance to smoking research: Nicotine Dependence (Shadel et al., 2014a), Coping Expectancies (Shadel et al., 2014b), Positive Emotional and Sensory Expectancies (Tucker et al., 2014a), Negative Health Expectancies (Edelen et al., 2014b),

Correspondence concerning this article should be addressed to: Maria Orlando Edelen, RAND Corporation, 20 Park Plaza, Suite 920, Boston MA 02116. Orlando@rand.org, 617-338-2059, x8634.

DECLARATION OF INTERESTS

The author of this work has no competing interests to disclose.

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Negative Psychosocial Expectancies (Stucky et al., 2014), and Social Motivations (Tucker et al., 2014b). Following PROMIS procedures, i.e. qualitative methods (Edelen et al., 2012) followed by modern psychometric techniques (e.g., item-factor analysis and item response theory (IRT), Hansen et al., 2014), we identified six unidimensional banks and developed fixed-length short forms (SFs) and dynamic computer adaptive tests (CATs) to measure these distinct constructs among daily and nondaily smokers. The banks' psychometric properties, including their reliability and initial validity, are reported in a special supplement of *Nicotine and Tobacco Research* (Hitsman, 2014), and new analyses indicate that the psychometric performance of the banks is sound and comparable across form (SF vs. CAT) and mode of administration (paper and pencil vs. computer; Stucky, Huang & Edelen, in press).

Validity analyses with the original calibration sample data ($N = 5384$) showed encouraging preliminary evidence that the banks are distinct in their content and related as expected to other measures (Edelen, 2014a). However, this evidence was based on incomplete bank data from the same sample that was used to develop the item banks. That is, the original calibration sample responded to the items according to a randomized block design that had high levels of planned missing data. Thus, the purpose of this paper is to replicate the initial validity findings for the Smoking Assessment Toolkit using two unique samples that responded to the complete SF representations of the item banks. Namely, we re-examined the banks' concurrent, convergent and discriminant validity by evaluating the banks' inter-correlations and correlations with the other smoking (e.g. smoking quantity and recency of quitting) and PROMIS measures (i.e., physical functioning, anxiety, alcohol consumption). We also examined the association of bank scores with three legacy measures, the Fagerström Test for Nicotine Dependence (FTND; Heatherton et al., 1991), the Questionnaire of Smoking Urges (QSU; Cox, Tiffany & Christen, 2001), and the Wisconsin Inventory of Smoking Dependence Motives (WISDM brief, Smith et al., 2010).

Method

Data Collection and Procedures

Participants were eligible if they were current smokers, 18 or older, smoked for at least a year, smoked in the past 30 days, and had no plans to quit within next 30 days. Smokers were classified as "daily smokers" if they had smoked on 28–30 of the past 30 days, and as "nondaily smokers" if they smoked less than 28 of the past 30 days. All study procedures were approved by the institution's internal review board.

The follow-up sample participants (FS; $N = 491$) were a subset of smokers from the calibration sample who were re-contacted approximately two years later through Harris Interactive's online panel via the internet and invited to participate in the survey. These respondents completed the survey over the internet and received points for their participation that are redeemable for gifts. Although all calibration sample participants who consented to be re-contacted were invited to participate in the follow-up survey, the FS was limited to 500 participants and recruitment was targeted so that the demographic and smoking status characteristics of FS participants matched that of the original sample as much as possible. As a result of this targeted enrollment, the calibration sample participants

who completed the follow-up survey were comparable to those who did not (NFS; $N=4893$) in terms of daily smoker status, gender, education and marital status. However, relative to non-participants from the calibration sample, follow-up survey participants were significantly more likely to be white (vs. Black, Hispanic, Asian or some other race; $\chi^2_{(3)}=28.28, p<.01$), were slightly older (mean age FS=47.66 vs. NFS=45.71; $t=3.92, p<.01$), and tended to be more committed smokers at the time of the calibration data collection (relative to NFS, FS had significantly higher baseline smoking quantity ($\chi^2_{(4)}=16.24, p<.01$); less interest in quitting; and were less likely to have made a recent quit attempt ($\chi^2_{(4)}=31.79, p<.01$)), although most of these differences were small in magnitude.

The community sample participants (CS; $N = 369$) were recruited via advertising (e.g., flyers, campus newspapers) at various community venues in several large US cities. Participants were randomly assigned to complete either a paper-and-pencil or internet-based version of the survey. The participants were paid \$5 for completing the eligibility screening and \$25 for completing the survey.

Measures

Demographics, smoking patterns and quitting history—All respondents indicated their gender, age, race/ethnicity, and education, as well as quantity of past 30 days smoking, time to first cigarette of the day, recency of latest quit attempt, and interest in quitting.

PROMIS smoking domains—Both samples completed SF versions of the six PROMIS smoking banks. Bank labels, SF composition, and marginal reliability (MR) which can be interpreted similarly to Cronbach's alpha reliability coefficient (Cai, 2011), are as follows: Nicotine dependence (8 items; marginal reliability (MR) = .84; e.g., “*When I run out of cigarettes, I find it almost unbearable*”); coping expectancies (4 items; MR = .85; e.g., “*I rely on smoking to deal with stress*”); emotional and sensory expectancies (6 items; MR = .86; e.g., “*I feel better after smoking a cigarette*”); health expectancies (6 items; MR = .87; e.g., “*Smoking is taking years off my life*”); psychosocial expectancies (6 items; MR = .85; e.g., “*People think less of me when they see me smoking*”), and social motivations (4 items; MR = .77; e.g., “*Smoking makes me feel better in social situations*”). SF scores were calculated for each domain using the translation tables referenced in the source publications.

Other PROMIS measures

Respondents in the CS completed PROMIS SFs including measures of anxiety (Pilkonis et al., 2012a), alcohol consumption (Pilkonis et al., 2012b), and physical functioning (Rose et al., 2008).

Legacy measures

The FS responded to three legacy smoking measures: the 6-item FTND (Heatherton et al., 1991), the QSU (10 items; Cox, Tiffany & Christen, 2001), and the 37-item WISDM brief (Smith et al., 2010).

Analyses

Following examination of demographic and smoking characteristics, we generated smoking bank SF means for daily and nondaily smokers and examined inter-correlations among the six smoking bank scores for each sample. We evaluated validity for daily and nondaily smokers in each sample according to bank score associations with the four smoking and quitting pattern variables. We then calculated the correlations of item bank scores with three PROMIS measures for daily and nondaily smokers in the CS. Finally, we examined correlations of the six smoking bank scores with the three legacy measures for daily and nondaily smokers in the FS.

Results

Demographic characteristics and smoking patterns indicate the FS and CS participants are comparable across gender (FS = 53% female, CS = 50% female; $\chi^2(1) = .63, p = .43$), but differ with respect to age (FS mean age = 48 years, CS mean age = 44 years; $t = 4.65, p < .01$), race/ethnicity (76% in FS were non-Hispanic White compared to 31% for CS; $\chi^2(1) = 179, p < .01$), education (30% in FS had completed a 4-year college compared to 22% for CS; $\chi^2(1) = 7.44, p < .01$), and cigarettes smoked per day (percent of sample that smoke more than 10 cigarettes per day = 64% and 45% for FS and CS, respectively; $\chi^2(1) = 30, p < .01$). More detailed information about the demographic and smoking characteristics of the samples can be found in Stucky et al. (in press) and in Table S1 of the online supplementary material.

SF scores for the FS and CS samples are comparable to patterns observed in the original calibration sample. Across domains, daily smoker means are consistently higher than means for nondaily smokers (daily smokers: FS range 46.5–51.6, CS range 49.8–55.8; nondaily smokers: FS range 35.6–46.8, CS range 43.7–52.1). Standard deviations (SDs) are close to 10 for all scores (range 8.64–10.9; see Table S2 in online supplementary material for the two samples' daily and nondaily smoker SF means and SDs).

The inter-bank correlations with the new samples generally replicate patterns we observed with the calibration sample. All inter-bank correlations and 95% confidence intervals for daily and nondaily smokers in the two samples can be found in Table S3 in the online supplementary material (lower diagonal entries are for daily smokers, upper diagonal contains nondaily). With few exceptions, banks are moderately associated with nicotine dependence in both samples among daily (FS range 0.43–0.60; CS range 0.05–0.65) and nondaily smokers (FS range 0.48–0.57; CS range 0.57–0.64), with coping expectancies showing exceptionally stronger correlations (daily $r = 0.60$ and 0.65 in FS and CS, respectively; nondaily $r = 0.57$ and 0.58 in FS and CS, respectively). However, the correlations of health and psychosocial expectancies with nicotine dependence among CS daily smokers were unexpectedly low. As observed in the calibration sample, the correlation between psychosocial and health expectancy scores is strong among both daily and nondaily smokers in both new samples (daily $r = 0.70$ and 0.59 in FS and CS, respectively; nondaily $r = 0.71$ and 0.76 in FS and CS, respectively).

Although the pattern of associations of smoking SFs with smoking and quitting items differs somewhat between the FS and CS (e.g., only among nondaily smokers in the CS the recency of quitting item is significantly negatively correlated with nicotine dependence and the interest in quitting is significantly negatively correlated with social motivations), two strong patterns observed in the calibration sample are replicated with the new samples across both smoker groups (see Table 1). Nicotine dependence is most strongly correlated with smoking quantity (daily $r = 0.29$ and 0.34 in FS and CS, respectively; nondaily $r = 0.53$ and 0.50 in FS and CS, respectively) and time to first cigarette of the day (daily $r = -0.42$ and -0.32 in FS and CS, respectively; nondaily $r = -0.51$ and -0.50 in FS and CS, respectively). Interest in quitting is most related to health (daily $r = 0.62$ and 0.49 in FS and CS, respectively; nondaily $r = 0.53$ and 0.50 in FS and CS, respectively) and psychosocial expectancies (daily $r = 0.59$ and 0.37 in FS and CS, respectively; nondaily $r = 0.52$ and 0.31 in FS and CS, respectively).

The correlations of the bank SF scores with two of the three PROMIS SF scores in daily and nondaily smokers in the CS also replicate previous findings from the calibration sample (see Table 2a). The exception is that whereas none of the banks were significantly associated with alcohol consumption in the calibration sample, five of the six bank scores have significant positive associations with alcohol consumption among nondaily smokers (range $r = 0.21$ – 0.38).

Lastly, the correlations of the bank SFs with three legacy measures among daily and nondaily smokers in the FS showed that nicotine dependence is strongly related to all legacy measures (see Table 2b), especially the WISDM total ($r = 0.76$ and 0.75 for daily and nondaily smokers respectively) and WISDM Primary ($r = 0.80$ and 0.78 for daily and nondaily smokers respectively). Health and psychosocial expectancies, however, are relatively weakly correlated with the legacy measures. The WISDM scales are overall more strongly associated with the six smoking banks than the FTND and QSU scales. The FTND is most strongly associated with nicotine dependence ($r = 0.39$ and 0.49 for daily and nondaily smokers respectively), whereas QSU is primarily associated with three of the six banks, including nicotine dependence ($r = 0.52$ and 0.61 for daily and nondaily smokers respectively), coping expectancies ($r = 0.51$ and 0.49 for daily and nondaily smokers respectively) and emotional and sensory expectancies ($r = 0.53$ and 0.47 for daily and nondaily smokers respectively).

Discussion

This paper presents new evidence for the validity of six item banks of the PROMIS Smoking Assessment Toolkit using two new samples. The new evidence together with results from the previous studies evaluating the psychometric properties of the item banks, support the utility of the Smoking Assessment Toolkit. The toolkit, which includes item banks, SFs and CATs, provides researchers and clinicians with an array of highly reliable approaches to assessment of key smoking domains. Admittedly, many clinicians may still prefer to evaluate smoking characteristics such as dependence or health expectancies utilizing single-item indicators. However, the CAT and SF options afforded by this toolkit represent a very low added burden and make integration of assessment with the clinical encounter a feasible

option. Given their excellent reliability, uptake of these tools may improve tracking of the effects of brief counseling to quit or motivational interview techniques often used by clinicians.

One of the most important limitations of the initial validity evaluation was that the items that form the six item banks were administered to the calibration sample via a randomized block design, thus we were unable to calculate SF scores for the banks, and full bank score calculations were estimated via multiple imputation methods (Edelen et al, 2014a). Thus it is encouraging to find that the patterns of associations between bank SF scores with smoking and quitting behaviors, and with the three PROMIS measures in this study are largely in line with previous findings.

The current study also adds information about the PROMIS banks' correlations with three widely-used legacy measures (FTND, QSU and WISDM). The pattern of associations reported here indicates that some score cross-walking may be possible. For example, the WISDM score is highly correlated with the nicotine dependence bank score. A crosswalk between these two instruments would facilitate interpretation of the nicotine dependence bank and would enable a comparison of results from studies using the WISDM with results based on the new smoking item banks.

Although this study uses newly collected data to address the limitations inherent in the original validity evaluation for the smoking item banks, further validity evidence for the banks, especially that pertaining to predictive validity and construct validity, is still needed. We expect that this evidence will begin to accumulate as the banks become more integrated into behavioral health research studies. The demographic differences between the two samples evaluated in this study, also must be taken into consideration when evaluating these results. Relative to the FS, the CS participants were less likely to be white, had less education and reported lower income. They also tended to express more interest in quitting smoking. Further, it should be noted that the pattern of validity coefficients did differ somewhat between the two samples. For example, the association of psychosocial expectancies with interest in quitting was generally stronger among the FS relative to the CS. However, the small number of significant differences in validity coefficients between samples lends support to the usefulness of the banks across the demographic variability represented by these samples. Finally, it is important to note that the sub-set of participants in this follow-up differed somewhat from the initial calibration sample. This follow-up sample of smokers tended to be generally more committed smokers, smoking more cigarettes per day on average than non-participants from the calibration sample, and expressing less interest in quitting. In fact, in addition to the demographic differences between the FS and CS noted above, this non-representative aspect of the FS with respect to smoking characteristics may be contributing to the slight differences observed between these two samples in the validity coefficients reported here.

Future directions

The smoking assessment toolkit has several attractive features including flexible administration options, strong psychometric properties, and encouraging validity evidence. Our team is conducting several analyses using data from these new samples to further the

evidence base for the smoking assessment toolkit. For example, in addition to developing scoring crosswalks from legacy measures to the new item banks, we are evaluating the mediating role of psychosocial and health expectancies in the association between advice to quit and desire to quit, examining use of alternative tobacco products and its association with bank scores, and modeling the stability of smoking bank scores over time and factors that influence their change. Further, the item banks have been translated into Spanish and fielded to a large sample of Spanish-speaking adult smokers in the US. Results from analyses evaluating the psychometric properties of the translated item banks have recently been published (Huang, in press). Finally, we plan to continue to build the Smoking Assessment Toolkit by expanding it to be relevant for smokers in the process of quitting. We hope our continued research efforts will result in increased uptake of the PROMIS Smoking Assessment Toolkit in future smoking research studies.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Highlights

- Validity findings replicate prior results for the Smoking Assessment Toolkit
- Toolkit correlations with legacy measures (FTND, QSU, WISDM) provide new evidence
- The psychometric evidence base for the PROMIS Smoking Assessment Toolkit is growing

Table 1

Correlations and 95% confidence intervals of item bank short forms with smoking measures for daily (D) and nondaily (ND) smokers in follow-up (FS; N=491) and community (CS; N=369) samples.

	Smoking quantity				Time to first cigarette of the day				Recency of last quit attempt				Interest in quitting			
	FS	CS	FS	CS	FS	CS	FS	CS	FS	CS	FS	CS	FS	CS	FS	CS
Nicotine Dependence	D 0.29** (0.20–0.38)	0.34** (0.22–0.45)	–0.42** (–0.49 – –0.33)	–0.32** (–0.43 – –0.08)	–0.06 (–0.16–0.04)	0.11 (–0.01–0.24)	0.27** (0.18–0.36)	–0.11 (–0.23–0.02)	0.27** (0.18–0.36)	0.11 (–0.01–0.24)	0.27** (0.18–0.36)	–0.11 (–0.23–0.02)	0.27** (0.18–0.36)	0.11 (–0.01–0.24)	0.27** (0.18–0.36)	–0.11 (–0.23–0.02)
	ND 0.53** (0.33–0.68)	0.50** (0.36–0.62)	–0.51** (–0.66 – –0.31)	–0.50** (–0.61–0.35)	0.11 (–0.13–0.34)	–0.24**† (–0.40 – –0.07)	0.24* (0.00–0.45)	0.40**† (0.25–0.54)	0.24* (0.00–0.45)	–0.24**† (–0.40 – –0.07)	0.24* (0.00–0.45)	0.40**† (0.25–0.54)	0.24* (0.00–0.45)	–0.24**† (–0.40 – –0.07)	0.24* (0.00–0.45)	0.40**† (0.25–0.54)
Coping Expectancies	D 0.16** (0.06–0.25)	0.27** (0.14–0.39)	–0.23** (–0.32–0.14)	–0.15* (–0.27 – –0.02)	–0.06 (–0.15–0.04)	0.03 (–0.10–0.16)	0.16** (0.06–0.25)	–0.25**† (–0.36 – –0.12)	0.16** (0.06–0.25)	0.03 (–0.10–0.16)	0.16** (0.06–0.25)	–0.25**† (–0.36 – –0.12)	0.16** (0.06–0.25)	0.03 (–0.10–0.16)	0.16** (0.06–0.25)	–0.25**† (–0.36 – –0.12)
	ND 0.43** (0.21–0.60)	0.21* (0.04–0.37)	–0.24 (–0.45–0.00)	–0.06 (–0.23–0.14)	0.09 (–0.15–0.32)	–0.19* (–0.35 – –0.02)	0.13 (–0.11–0.36)	0.15 (–0.03–0.31)	0.09 (–0.15–0.32)	–0.19* (–0.35 – –0.02)	0.13 (–0.11–0.36)	0.15 (–0.03–0.31)	0.09 (–0.15–0.32)	–0.19* (–0.35 – –0.02)	0.13 (–0.11–0.36)	0.15 (–0.03–0.31)
Emotional and Sensory Expectancies	D 0.20** (0.10–0.29)	0.28** (0.15–0.39)	–0.25** (–0.34 – –0.16)	–0.21** (–0.32 – –0.08)	0.02 (–0.08–0.12)	0.03 (–0.10–0.16)	–0.10* (–0.20–0.00)	–0.32**† (–0.43 – –0.20)	0.02 (–0.08–0.12)	0.03 (–0.10–0.16)	–0.10* (–0.20–0.00)	–0.32**† (–0.43 – –0.20)	0.62** (0.55–0.67)	–0.20** (–0.32 – –0.07)	0.62** (0.55–0.67)	0.49** (0.39–0.58)
	ND 0.20 (–0.04–0.42)	0.24** (0.08–0.40)	–0.24* (–0.45 – 0.00)	–0.22* (–0.37 – –0.05)	0.23 (–0.01–0.44)	–0.10 (–0.26–0.07)	0.00 (–0.24–0.23)	0.07 (–0.10–0.24)	0.23 (–0.01–0.44)	–0.10 (–0.26–0.07)	0.00 (–0.24–0.23)	0.07 (–0.10–0.24)	0.53** (0.33–0.68)	–0.29** (–0.43 – –0.12)	0.53** (0.33–0.68)	0.50** (0.36–0.62)
Health Expectancies	D 0.02 (–0.08–0.11)	0.02 (–0.11–0.15)	–0.09 (–0.18 – 0.01)	–0.19** (–0.31 – –0.06)	–0.32** (–0.40 – –0.23)	–0.20** (–0.32 – –0.07)	0.62** (0.55–0.67)	0.49** (0.39–0.58)	–0.09 (–0.18 – 0.03)	–0.19** (–0.31 – –0.06)	–0.32** (–0.40 – –0.23)	–0.20** (–0.32 – –0.07)	0.62** (0.55–0.67)	–0.20** (–0.32 – –0.07)	0.62** (0.55–0.67)	0.49** (0.39–0.58)
	ND 0.35**† (0.12–0.54)	0.30** (0.14–0.45)	–0.22 (–0.44 – 0.02)	–0.34** (–0.48 – –0.17)	–0.08 (–0.31–0.16)	–0.29** (–0.43 – –0.12)	0.53** (0.33–0.68)	0.50** (0.36–0.62)	–0.22 (–0.44 – 0.02)	–0.34** (–0.48 – –0.17)	–0.08 (–0.31–0.16)	–0.29** (–0.43 – –0.12)	0.53** (0.33–0.68)	–0.29** (–0.43 – –0.12)	0.53** (0.33–0.68)	0.50** (0.36–0.62)
Psychosocial Expectancies	D 0.03 (–0.07–0.13)	0.00 (–0.13–0.13)	–0.07 (–0.16 – 0.03)	0.01 (–0.12–0.14)	–0.29** (–0.38 – –0.20)	–0.29** (–0.40 – –0.17)	0.59** (0.52–0.65)	0.37** (0.25–0.47)	–0.07 (–0.16 – 0.03)	0.01 (–0.12–0.14)	–0.29** (–0.38 – –0.20)	–0.29** (–0.40 – –0.17)	0.59** (0.52–0.65)	–0.29** (–0.40 – –0.17)	0.59** (0.52–0.65)	0.37** (0.25–0.47)
	ND 0.26* (0.02–0.46)	0.37**† (0.21–0.51)	–0.24 (–0.45 – 0.00)	–0.22** (–0.38 – –0.06)	–0.15 (–0.37–0.09)	–0.38** (–0.52 – –0.23)	0.52** (0.32–0.67)	0.31** (0.15–0.46)	–0.24 (–0.45 – 0.00)	–0.22** (–0.38 – –0.06)	–0.15 (–0.37–0.09)	–0.38** (–0.52 – –0.23)	0.52** (0.32–0.67)	–0.38** (–0.52 – –0.23)	0.52** (0.32–0.67)	0.31** (0.15–0.46)
Social Motivations	D 0.16** (0.07–0.25)	0.27** (0.15–0.39)	–0.22** (–0.31 – –0.13)	–0.08 (–0.21–0.05)	–0.09 (–0.18–0.01)	0.09 (–0.04–0.22)	0.08 (–0.02–0.17)	–0.15**† (–0.28 – –0.03)	–0.22** (–0.31 – –0.13)	–0.08 (–0.21–0.05)	–0.09 (–0.18–0.01)	0.09 (–0.04–0.22)	0.08 (–0.02–0.17)	–0.15**† (–0.28 – –0.03)	0.08 (–0.02–0.17)	–0.15**† (–0.28 – –0.03)
	ND 0.32** (0.09–0.51)	0.11 (–0.07–0.28)	–0.25* (–0.46 – –0.01)	–0.06 (–0.23–0.12)	0.22 (–0.02–0.44)	0.07 (–0.10–0.24)	0.07 (–0.16–0.30)	0.08 (–0.09–0.25)	–0.25* (–0.46 – –0.01)	–0.06 (–0.23–0.12)	0.22 (–0.02–0.44)	0.07 (–0.10–0.24)	0.07 (–0.16–0.30)	0.07 (–0.16–0.30)	0.07 (–0.16–0.30)	0.08 (–0.09–0.25)

NOTE: Time to first cigarette of the day high score=longer wait; recency of last quit attempt high score =less recent; interest in quitting high score=more interested;

* indicates correlations are significant at $p<.05$;

** indicates correlations are significant at $p<.01$;

† indicates D significantly different from ND (within sample) at $p<.05$;

†† indicates FS significantly different from CS (within smoker status) at $p<.05$.

Correlations and 95% confidence intervals of item bank short forms with PROMIS[®] measures for daily (D) and nondaily (ND) smokers in community sample (N=369)

Table 2a

		Nicotine Dependence	Coping Expectancies	Emotional and Sensory Expectancies	Health Expectancies	Psychosocial Expectancies	Social Motivations
Anxiety	D	0.38** (0.27–0.49)	0.45** (0.34–0.55)	0.28** (0.15–0.39)	0.16* (0.03–0.28)	0.30** (0.17–0.41)	0.32** (0.19–0.43)
	ND	0.38** (0.23–0.52)	0.46** (0.31–0.58)	0.30** (0.14–0.45)	0.29** (0.13–0.44)	0.42** (0.27–0.55)	0.33** (0.16–0.47)
Alcohol Consumption	D	–0.10 (–0.27–0.08)	0.16 (–0.02–0.33)	0.15 (–0.03–0.32)	0.10 (–0.08–0.28)	0.05 (–0.13–0.22)	0.08 (–0.10–0.26)
	ND	0.22* (0.01–0.41)	0.38** (0.18–0.55)	0.17 (–0.04–0.37)	0.21* (0.00–0.41)	0.29** (0.08–0.47)	0.31** (0.10–0.49)
Physical Functioning	D	0.16* (0.03–0.28)	0.18** (0.05–0.31)	0.07 (–0.07–0.19)	0.28** (0.15–0.39)	0.23** (0.10–0.35)	0.19** (0.06–0.32)
	ND	0.35** (0.19–0.49)	0.15 (–0.02–0.32)	0.20* (0.03–0.36)	0.40** (0.24–0.53)	0.39** (0.24–0.53)	0.16 (–0.02–0.32)

NOTE:

* indicates correlations are significant at $p < .05$;

** indicates correlations are significant at $p < .01$.

Table 2b

Correlations and 95% confidence intervals of item bank short form scores with three legacy measures for daily (D) and nondaily (ND) smokers in follow-up sample (N=491).

		Nicotine Dependence	Coping Expectancies	Emotional and Sensory Expectancies	Health Expectancies	Psychosocial Expectancies	Social Motivations
FTND	D	0.39** (0.30–0.47)	0.21** (0.12–0.30)	0.22** (0.12–0.31)	0.20** (0.10–0.29)	0.15* (0.05–0.24)	0.19** (0.09–0.28)
	ND	0.49** (0.29–0.65)	0.28* (0.04–0.48)	0.30* (0.06–0.50)	0.10 (–0.14–0.33)	0.18 (–0.06–0.40)	0.34** (0.11–0.53)
QSU	D	0.52** (0.45–0.59)	0.51** (0.43–0.58)	0.53** (0.46–0.60)	0.17* (0.08–0.27)	0.15* (0.05–0.24)	0.44** (0.35–0.51)
	ND	0.61** (0.44–0.74)	0.49** (0.28–0.65)	0.47** (0.25–0.63)	0.28* (0.04–0.48)	0.30* (0.07–0.50)	0.54** (0.35–0.69)
WISDM	D	0.76** (0.72–0.80)	0.65** (0.59–0.70)	0.65** (0.59–0.70)	0.33** (0.24–0.42)	0.34** (0.25–0.42)	0.61** (0.55–0.67)
	ND	0.75** (0.63–0.84)	0.61** (0.43–0.74)	0.68** (0.52–0.79)	0.27* (0.04–0.48)	0.31** (0.08–0.51)	0.66** (0.50–0.77)
WISDM Primary	D	0.80** (0.76–0.83)	0.48** (0.40–0.55)	0.42** (0.34–0.50)	0.45** (0.37–0.53)	0.46** (0.38–0.53)	0.43** (0.34–0.50)
	ND	0.78** (0.66–0.85)	0.46** (0.25–0.62)	0.45** (0.23–0.62)	0.42* (0.20–0.60)	0.47** (0.26–0.63)	0.47** (0.26–0.63)
WISDM Secondary	D	0.63** (0.56–0.68)	0.66** (0.60–0.71)	0.71** (0.66–0.76)	0.20** (0.11–0.30)	0.30** (0.11–0.30)	0.66** (0.60–0.71)
	ND	0.65** (0.49–0.77)	0.63** (0.47–0.75)	0.75** (0.62–0.84)	0.14 (–0.10–0.37)	0.17 (–0.07–0.39)	0.71** (0.57–0.81)

NOTE:

* indicates correlations are significant at $p < .05$;

** indicates correlations are significant at $p < .01$.