

“Supplementary Materials”

Appendix A. List of Constructs and Evaluation Form sent to External Subject Matter Experts

Dear reviewer,

Below are a series of constructs and definitions that we have compiled as an initial step in creating dependence measures for e-cigarettes for youth and adults. We are asking you to help in this initial phase of compiling a comprehensive list of constructs that should be included in the creation of these

dependence measures. We would appreciate your feedback in assessing if the constructs and definitions below are 1) understandable 2) necessary for the creation of dependence measures and 3) appropriate in their specificity. Additionally, we would appreciate any other general feedback you would wish to provide regarding these constructs and definitions. Please examine the accompanying power-point presentation for some more examples of questions within each construct but please note that these are just examples. We plan to develop items for each construct at our next meeting. **WE WOULD APPRECIATE A RESPONSE BY OCTOBER 7TH SO THAT WE CAN COMPILE THIS INFORMATION PRIOR TO OUR NEXT MEETING ON OCTOBER 12-13TH.**

Construct	Definition and example question (Specific wording of example questions are included here to give a better understanding of the construct)	Is the construct and corresponding definition clear to understand? Y/N (If no please explain what clarification you need)	Is the construct and corresponding definition necessary for a set of comprehensive nicotine dependence measures? Y/N (If no please explain your reasoning)	Should this construct be kept, deleted, changed in some way, or merged with another construct? Please describe	Other comments regarding this construct and definition
Quantity and frequency of use	These questions relate to vaping status of the individual. Possible example questions include, "How many puffs, on average, do you take on your e-cigarette on a typical day?" "How many e-cigarette vaping episodes do you have on a typical day?" "How many days per week do you vape?"				
Social Goals	This construct refers to the social cues that spur use as well as the sense of identity related to use. A possible example question related to this construct includes "I am around vapers most of the time"				
Tolerance	This construct refers to a person's diminished reaction due to repeated use. This result of tolerance is that a person may use the product more frequently or use a higher concentration to get the desired effect. A possible example question is "Have you switched e-cigarette devices to get a better effect?"				

Withdrawal symptoms	This construct refers to the uncomfortable physical or psychological effects of discontinued or decreased use. A possible example question is "How soon after you wake up do you vape?"				
Craving/urge to use	This construct refers to the appetitive urge to use an e-cigarette. A possible example question includes, "How much are you craving an e-cigarette right now."				
Impaired control	This construct refers to a person's inability to limit or abstain from use even when one would wish to; for example, not being able to refrain from use despite having something else to do or suffering physical consequence due to use. A possible example question includes, "Is it hard to keep from vaping in places where you are not supposed to"				
Automaticity	This construct refers to the act of reaching for an e-cigarette without thinking about it. A possible example question includes "Have you ever found yourself starting to vape without consciously deciding to?"				
Emotional reactions to encourage use	This construct refers to the idea the feeling that using an e-cigarette would make the emotional state of the user better. A possible example question includes, "I could control things better if I could vape."				
Affiliative attachment to the product	This construct refers to experiencing a friendship-like attachment and relationship to vaping. Possible example questions include, "I feel alone without my e-cigarette."				
Sensory dependence	This construct refers to experiencing physical pleasure in the physical act of vaping. A possible example question includes, "I enjoy the feeling of				

exhaling.”				
Would you recommend having a construct that differentiates nicotine dependence from e-cigarette dependence? Please elaborate				
Would you recommend the use of a nicotine dependence measure that assesses dual dependence on e-cigarettes and cigarettes, or do you feel that cigarette and e-cigarette dependence should be assessed independently? Please elaborate.				
Is there a construct related to e-cigarette dependence that you feel is missing? If so please elaborate.				
Please include any other general comment or suggestions:				

Thank you for your help with this important first step in developing a comprehensive list of constructs to measure e-cigarette dependence.

Please let us know if you would be willing to help us the next step, which will involve reviewing the items within each construct area.

YES NO

Appendix B. Tobacco Use Disorder Diagnostic Criteria, DSM-5

The revised Diagnostic and Statistical Manual of Mental Disorders, fifth edition (American Psychiatric Association, 2013), provides criteria for assessing tobacco use disorder on a continuum from mild to severe. Tobacco use disorder is considered a problematic pattern of use leading to clinically significant distress or impairment based on at least two criteria over a 12-month period. Eleven possible criteria are used to diagnose tobacco use disorder severity as mild (2-3 criteria), moderate (4-5 criteria), or severe (6 or more criteria). These criteria include:

1. Tobacco use in larger amounts or over longer periods of time
2. Persistent desire or unsuccessful efforts to cut down or control use
3. A great deal of time spent on obtaining or using tobacco
4. Craving, or a strong desire or urge to use tobacco
5. Continued tobacco use resulting in a failure to fulfill major role obligations at work, school, or home

6. Continued tobacco use despite having persistent or recurrent social or interpersonal problems caused or exacerbated by effects of tobacco (e.g., arguments with others about tobacco use)

7. Important social, occupational, or recreational activities are given up or reduced because of tobacco use

8. Recurrent tobacco use in situations in which it is physically hazardous (e.g., smoking in bed)

9. Continued use despite knowledge of having a persistent or recurrent physical or psychological problem that is likely to have been caused or exacerbated by tobacco

10. Tolerance, as defined by either the need for markedly increased amounts of tobacco to achieve the desired effect or a markedly diminished effect with continued use of the same amount of tobacco.

11. Withdrawal, as manifested by either the characteristic withdrawal syndrome (e.g., craving, irritability, restlessness, difficulty concentrating, changes in sleep or appetite) or the use of tobacco to relieve or avoid withdrawal symptoms.