



# Effectiveness Of Click City®: Tobacco

## A Smoking And Vaping Prevention Program For 5th Graders

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### Purpose

- Describe the revision of Click City®: Tobacco, an efficacious school-based tobacco prevention program, to include content on vaping e-cigarettes.
- Present preliminary results from an effectiveness trial evaluating the revised program.

### Rationale for Adding E-Cigarette Use to Click City®: Tobacco

- Among adolescents, the prevalence of vaping e-cigarettes has exceeded that of smoking.
- E-cigarette use in adolescence is predictive of subsequent smoking.
- E-cigarette use in adolescence is associated with neurological consequences.

### Description of Click City®: Tobacco

- An online, engaging, interactive program for 5th graders, with a 6th grade booster.
- Program is delivered with high fidelity, with little teacher involvement.
- Eight ~20 minute lessons delivered over 4 weeks in 5th grade, and 2 lessons delivered in 6th grade.
- Lessons include components each targeting a specific risk factor predictive of tobacco initiation (see Figure 1).
- Components were developed iteratively with feedback from 5th graders using focus groups and usability assessments.
- Components were empirically evaluated prior to including them in the final program. Only components that were effective at changing the targeted risk factor were included.



Figure 1. Screen shots from Reality Check, a component targeting students' social images of youth who vape e-cigarettes.

### Theoretical Foundation of Click City®:Tobacco

- Program development was guided by theories of health behaviors
  - The Prototype/Willingness model (social images; Gibbons et al., 2003).
  - The Theories of Planned Behavior and Reasoned Action (normative beliefs, attitudes; Ajzen, 1988; 1991).
  - Risk perception theory (based on the affect heuristic, Slovic et al., 2002, positive affect results in low risk).
- As shown in Figure 2, risk factors (See Table 1) predict intentions and willingness which are subsequently associated with behavior.

Figure 2. Theoretical model guiding prevention

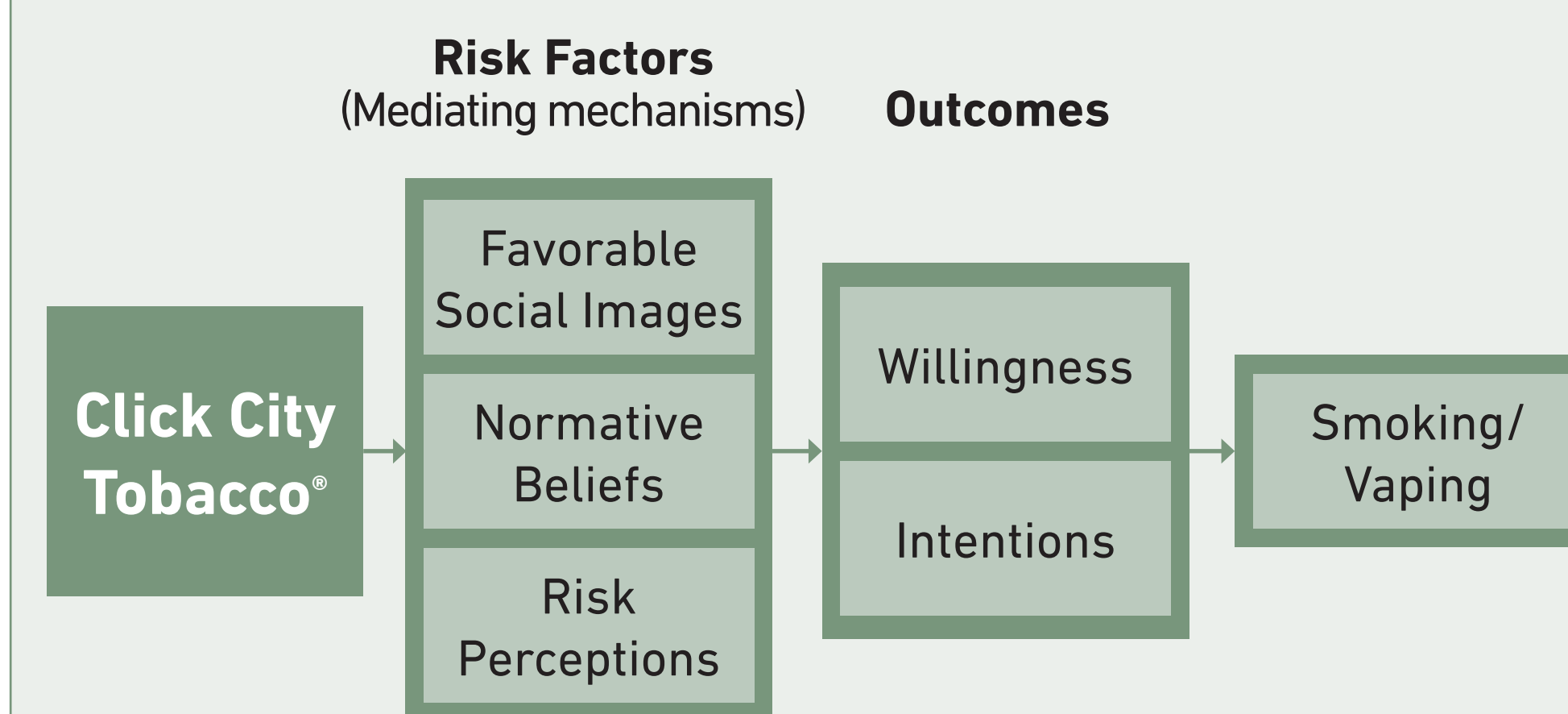


Table 1. Risk Factors and Outcomes

Outcomes	
Behavioral intentions	Planning or intending to engage in the behavior
Willingness	Willing to engage in the behavior if the opportunity presents itself
Risk Factors	
Favorable social images	Youth perceive that smokers/vapers are cool, exciting and popular
Prescriptive norms	Perception of friend's approval of the behavior
Normative favorable social images	Perception of friend's favorable social images
Risk of addiction	Addiction results in lack of control, and difficulty in quitting
Risk of secondhand aerosol/smoke	Dangers of secondhand aerosol/smoke
Risk of cumulative consequences	Risk increases with each cigarette/e-cigarette; every cigarette/e-cigarette does some harm (Slovic, 2000)

### Effectiveness Trial

#### METHOD

- Recruited and randomized 44 schools in two states, Arizona (Ariz., 26 schools) and Oregon (Ore., 18).
- Stopped the trial due to the COVID-19 pandemic with completed data collected from 26 schools (16 Ariz., 10 Ore.; 1013 students in Ariz., 424 in Ore.)
- Data analyzed using a mixed model analysis of variance with students nested within schools.

### Results

Table 2. Preliminary Results from Effectiveness Trial

	Control Group Means		Intervention Group Means		F	p*	Effect size (d)
	Pre	Post	Pre	Post			
<b>Intention and Willingness</b>							
Intention to smoke	2.52	2.60	2.48	2.37	F(2,58.1) = 4.48	p<.01	0.17
Intention to vape	2.64	2.63	2.55	2.43	F(2,65.7) = 3.39	p<.05	0.11
Willingness to smoke	4.42	4.56	4.39	4.37	F(2,78.6) = 2.35	p = .051	0.16
Willingness to vape	4.53	4.66	4.53	4.48	F(2,54.7) = .51	p = .301	0.10
<b>Social Images and Subjective Norms</b>							
Social images of smokers	4.33	4.25	4.22	3.27	F(2,34.8) = 49.67	p<.001	0.60
Social images of vapers	4.44	4.41	4.28	3.34	F(2,35.6) = 50.17	p<.001	0.60
Normative social images of smokers	3.90	3.77	3.85	3.46	F(2,40.2) = 40.52	p<.001	0.41
Normative social images of vapers	4.03	3.87	3.88	3.20	F(2,36.6) = 38.50	p<.001	0.59
Friends approval of smoking	3.39	3.40	3.34	3.24	F(2,45.9) = 4.54	p = .008	0.10
Friends approval of vaping	3.49	3.54	3.46	3.32	F(2,42.5) = 6.08	p = .003	0.17
<b>Risk Perceptions: Health Consequences</b>							
Risk of second-hand smoke exposure	8.98	9.65	9.16	12.38	F(2,65.3) = 245.12	p<.001	0.62
Risk of second-hand vape exposure	8.34	9.05	8.58	12.07	F(2,42.3) = 165.75	p<.001	0.66
Risk of cumulative consequences of smoking	26.14	25.49	27.04	28.74	F(2,33.9) = 9.21	p<.001	0.27
Risk of cumulative consequences of vaping	24.67	24.42	25.42	28.50	F(2,45.9) = 40.95	p<.001	0.38
Risk of smoking each cigarette	7.81	7.85	7.91	8.67	F(2,45.4) = 50.04	p<.001	0.42
Risk of vaping each e-cigarette	7.65	7.79	7.76	8.63	F(2,44.9) = 63.23	p<.001	0.40
<b>Risk Perceptions: Addiction</b>							
Risk of addiction from smoking	14.85	15.09	15.32	17.85	F(2,40.9) = 41.77	p<.001	0.33
Risk of addiction from vaping	14.68	15.00	15.25	17.95	F(2,37.4) = 38.88	p<.001	0.38
Control over smoking	40.34	39.33	38.88	29.51	F(2,38.1) = 70.84	p<.001	0.57
Control over vaping	39.43	38.49	37.96	29.00	F(2,39.8) = 65.74	p<.001	0.55
Difficulty quitting: Smoking	15.42	15.15	16.11	18.64	F(2,37.9) = 46.26	p<.001	0.58
Difficulty quitting: Vaping	15.28	15.05	16.05	18.61	F(2,38.6) = 46.26	p<.001	0.58

\*Probability based on one-tailed tests  
 Per Cohen, Small effect = .10; medium = .50

### Discussion

- Click City®: Tobacco changed risk factors in the expected direction.
- The small effects for prescriptive norms, intentions and willingness were due to restriction of range at baseline. Few intended to or were willing to vape/smoke.
- We will continue the program evaluation with 18 additional schools when schools reopen for in-person instruction.
- The complete data set from the entire evaluation will add to the diversity of students and increase the variability of baseline measures of intentions and willingness.