

Profiles of tobacco product use and related consumer characteristics in the US and Israel: A multiple-group latent class analysis

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Background

- The global tobacco market has dramatically evolved in the past decade to include a broad range of alternative tobacco products, including e-cigarettes, heated tobacco products (HTPs), cigars, hookah, and various forms of smokeless tobacco products.
- The product market and regulatory context across countries vary greatly; thus, research assessing country-specific tobacco use is imperative for informing tobacco control efforts.
- Diffusion of Innovations Theory (DOI) explains how, why, and at what rate new ideas and technology – like these products – are adopted in different social systems.
- To understand the role of regulatory context for the tobacco market, it is critical to study differences in consumer behavior across countries with differing sociopolitical characteristics.
- However, limited research has examined the adult tobacco use profiles across countries or using a DOI perspective.

Research Aims

We used data from adults in the US and Israel to assess:

- different tobacco use profiles (using LCA) among US and Israeli adults.
- correlates of tobacco use classes including values of “innovation” and “conscientiousness” (per DOI).

Methods

Design: A cross-sectional online survey focused on tobacco use and related factors conducted in 2021.

Sample:

- 2,222 adults in the US (n=1,128) and Israel (n=1,094).
- US participants were recruited by Ipsos using KnowledgePanel® augmented with an opt-in (i.e., off-panel) sample of Asian tobacco users. Israeli participants were recruited via the opt-in approach.
- Analytic sample: Participants reporting past 30-day (current) use of ≥1 tobacco product (US, n=382; Israel, n=561).

Measures :

Tobacco use: Past 30-day (current) use of 7 products: cigarettes, e-cigarettes, HTPs, hookah/waterpipe, cigar products, pipe tobacco, and smokeless tobacco

- ❖ Coded into: any vs. no use for each product (e.g., cigarette, e-cigarette...)

Correlates:

- ❖ **Consumer values** (innovation, conscientiousness): 11 items with 2 variables created based on factor analysis: innovation and conscientiousness (Cronbach’s alpha: .80 and .67)
- ❖ **Covariates:** Age (years), level of formal education, relationship status, and monthly income at T1

Data Analysis:

- Latent class analysis (LCA)** based on 7 tobacco product use variables (yes vs. no). **Multiple group LCA** with measurement invariance assessed by Likelihood Ratio Test
- Multinomial logistic regression

Results

Table 1: Selected sample characteristics

Variables	US sample (N=382)	Israel sample (N=561)
Sociodemographics		
Age, M (SD)	34.29 (7.09)	30.43 (7.57)
Female (vs. male)	176 (46.1)	240 (42.8)
Sexual minority (vs. straight)	55 (14.4)	109 (19.4)
≥college degree (vs. <college)	126 (33.0)	243 (43.3)
Married/cohabitating (vs. other)	189 (49.5)	325 (57.9)
Consumer values, M (SD)		
Innovation	2.78 (1.02)	3.15 (0.87)
Conscientiousness	3.64 (0.66)	3.58 (0.64)
Number of tobacco products used, M (SD)		
Current (past 30-day) tobacco use		
Cigarettes	253 (66.2)	428 (76.3)
E-cigarettes	170 (44.5)	275 (49.0)
Heated tobacco products	36 (9.4)	136 (24.2)
Hookah	62 (16.2)	238 (42.4)
Cigars	113 (29.6)	116 (20.7)
Pipe	29 (7.6)	90 (16.0)
Smokeless tobacco	43 (11.3)	91 (16.2)

Figure 1: Latent classes by country (measurement invariance rejected)

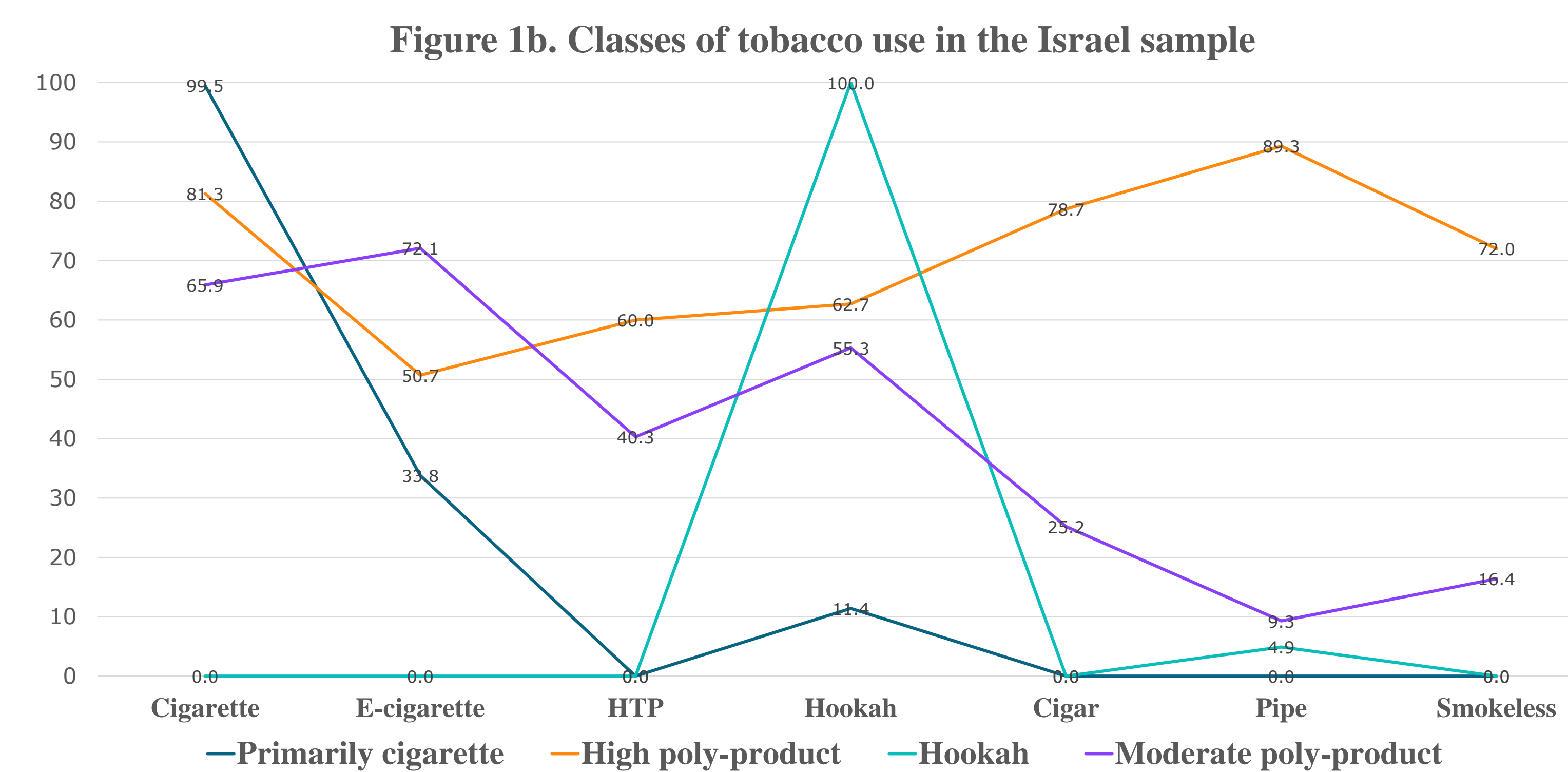
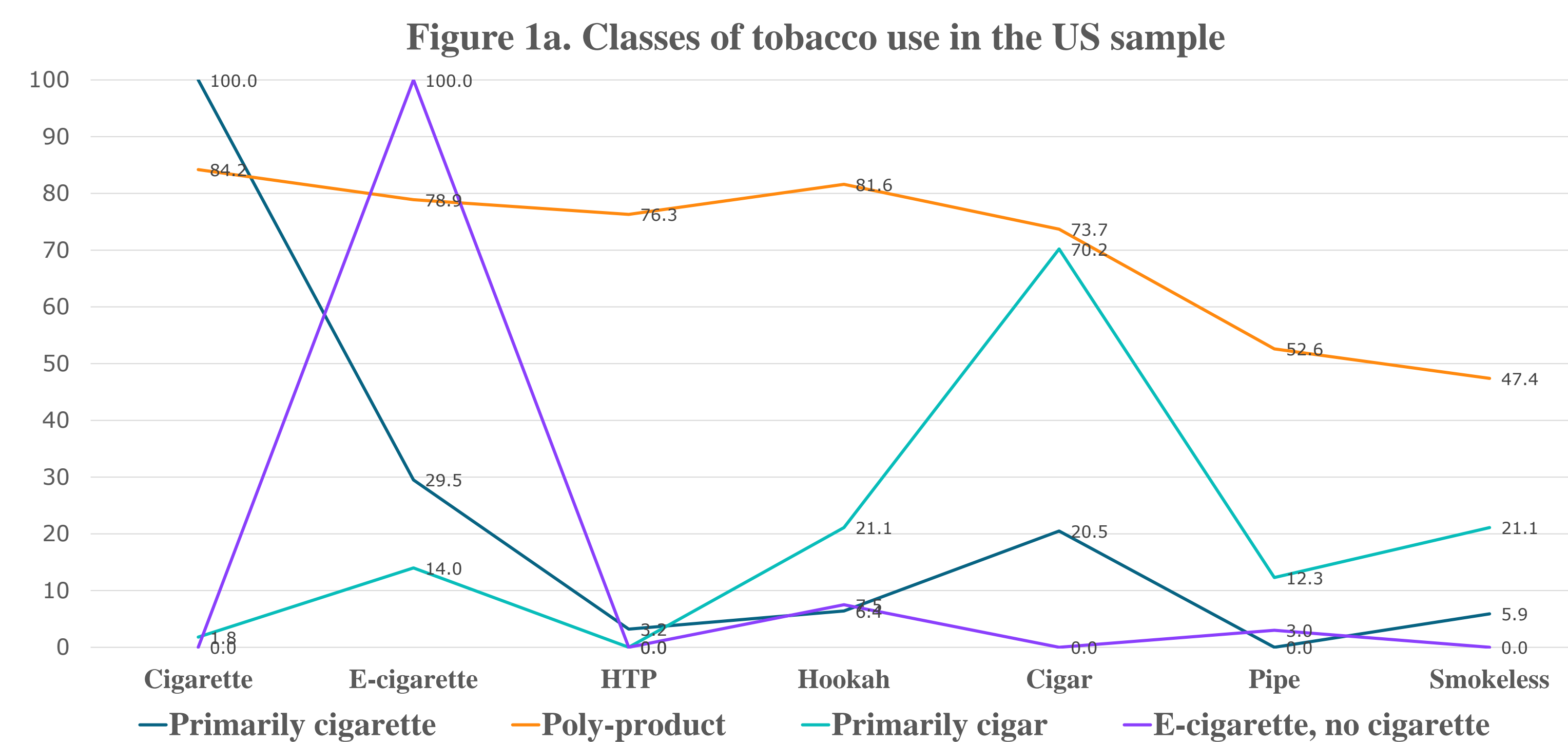


Table 2: Correlates of latent class membership in the US

	Poly-product	Primarily cigar	E-cigarette, no cigarette			
Sociodemographic variables						
Age	0.97	0.92, 1.03	0.96	0.91, 1.00	0.93	0.89, 0.97
Female (ref: male)	0.68	0.31, 1.46	0.49	0.25, 0.97	1.24	0.68, 2.23
Sexual minority (ref: straight)	0.68	0.22, 2.11	0.32	0.09, 1.11	0.98	0.45, 2.11
Race/ethnicity (ref: White)						
Black	4.63	1.56, 13.76	3.79	1.78, 8.07	0.83	0.37, 1.84
Asian	4.01	1.23, 12.99	0.77	0.25, 2.33	0.71	0.28, 1.81
Hispanic	3.04	0.88, 10.55	1.09	0.35, 3.34	0.54	0.21, 1.42
≥College degree (ref: <college)	1.5	0.63, 3.58	2.31	1.15, 4.64	1.49	0.76, 2.94
Married/cohabitating (ref: other)						
	0.98	0.45, 2.16	1.17	0.60, 2.28	1.15	0.62, 2.12
Consumer values						
Innovation	2.32	1.51, 3.57	1.00	0.71, 1.41	1.35	1.00, 1.82
Conscientiousness	0.97	0.56, 1.69	1.29	0.78, 2.01	1.32	0.83, 2.08

Table 3: Correlates of latent class membership in Israel

	High poly-product	Hookah	Moderate poly-product			
Sociodemographic variables						
Age	0.99	0.95, 1.03	0.98	0.93, 1.03	0.93	0.90, 0.96
Female (ref: male)	0.34	0.19, 0.60	0.71	0.36, 1.42	0.43	0.29, 0.65
Sexual minority (ref: straight)	2.93	1.53, 5.61	1.06	0.39, 2.81	1.51	0.88, 2.58
Arab (ref: Jewish)	0.95	0.44, 2.08	3.85	1.72, 8.33	1.01	0.64, 1.79
≥College degree (ref: <college)	1.08	0.59, 1.99	1.95	0.93, 4.10	1.88	1.21, 2.91
Married/cohabitating (ref: other)						
	0.64	0.35, 1.14	0.63	0.30, 1.33	1.01	0.65, 1.55
Consumer values						
Innovation	1.43	1.02, 1.99	0.66	0.44, 0.99	1.21	0.96, 1.54
Conscientiousness	0.65	0.42, 1.02	0.96	0.56, 1.67	0.58	0.41, 0.80

Note: Reference group for both countries: primarily cigarette use class

Discussion

- Four** latent classes among US and Israel adults, separately
- Both included **primary cigarette use class** (58% in US vs. 39% in Israel) and **poly-product use class** (10% in US vs. 13% in Israel)
- However, **primary cigar use class** in US (14%) vs. **hookah use class** (7%) in Israel; **e-cigarette-no cigarette use class** in US (18%) vs. **moderate poly-product use** in Israel (40%)
- Compared to primarily cigarette users, poly-product users in both countries and e-cigarette-no cigarette users in the US were **more innovation-oriented**, and moderate poly-product users in Israel had **lower conscientiousness scores**, supporting DOI.
- Findings illustrated the utility of DOI in contextualizing tobacco use profiles across countries, particularly in relation to the sociopolitical context of tobacco regulation and marketing.

Strength

- Multiple-group LCA approach to determine use profiles across countries
- Sociodemographic and consumer characteristics potentially targeted by the tobacco industry in relation to class membership were examined

Limitations:

- Cross-sectional design
- Self-reported tobacco use