

INTRODUCTION

- The Food and Drug Administration (FDA) acknowledges that there is a continuum of risk for tobacco and nicotine products, and that it is likely that e-cigarettes are less harmful than combustible cigarettes as they release fewer carcinogens and toxicants [1].
- Women, Hispanic and non-Hispanic black smokers, and smokers with lower educational attainment and/or lower income are more likely to perceive e-cigarettes as equally or more harmful than cigarettes [2;3].
- E-cigarette or vaping product use-associated lung injury, known as EVALI, occurred in the middle of 2019 and peaked in September of that year. The cause of EVALI was found to largely be from THC vaping devices. However, a majority of the media coverage failed to distinguish this and instead focused on e-cigarette safety and absolute risks.
- Communication surrounding EVALI in the media may have played a role in the changing relative harm perceptions about tobacco products [4].
- OBJECTIVE:** To assess whether risk perceptions of e-cigarettes changed over time from 2018 to 2022 and whether those changes varied by demographic groups.

METHODS

- Data was collected as part of a large, naturalistic, randomized, controlled clinical trial for e-cigarettes in the US, conducted from May 2018 to March 2022 aiming to examine the naturalistic course of uptake and use of e-cigarettes. For a description of the full methods of the parent trial see the citation [5].
- The study consisted of adult smokers with minimal history of e-cigarette use (N=638). At baseline, participants were asked to rate how harmful to them personally smoking cigarettes and using e-cigarettes was on a scale of 0 to 10.
- A relative risk difference score for e-cigarettes was calculated by subtracting the cigarette risk score from the e-cigarette risk score such that a higher score indicates finding e-cigarettes to be riskier relative to cigarettes. Participants also answered a demographics survey at baseline. 1 participant did not complete the full risk assessment and was excluded (N=637).
- Participants also answered a demographics survey at baseline.
- Participants were grouped into 7-11-month long blocks based on enrollment date, sample size, and the EVALI peak.

STATISTICS

- Statistical analyses focused on testing 1) whether there are changes in relative risk perceptions of e-cigarettes over the time the study was enrolling and 2) whether these changes differed by demographics including race, ethnicity, sex, age, education, and income.
- The following variables were analyzed using separate ANOVAs:
 - Sex
 - Race (White, All Else)
 - Income (<\$25k, \$25k to less than \$50k, \$50k to less than \$75k, >\$75K)
 - Educational Attainment (High School Diploma or Less, Some College or Technical School, College Degree or More)
 - Ethnicity (Non-Hispanic, Hispanic)
 - Motivation to Quit (0-6=low, 7-10=high)
 - Cigarettes Per Day (0-15, 16+)
 - E-cigarette Ever-Use (yes, no)

PARTICIPANT CHARACTERISTICS AND ABSOLUTE RISK

N=637		Motivation to Quit, No. (%)	
Age, mean (SD)	42.27 (11.5)	Low (0-6)	468 (73.5)
Sex, No. (%)		High (7-10)	169 (26.5)
Male	296 (46.5)	Ever Use of E-Cigarette, No. (%)	
Female	341 (53.5)	Yes	258 (40.5)
Race, No. (%)		No	379 (59.5)
White	436 (68.4)	Education, No. (%)	
All Else	201 (31.6)	High School or less	197 (30.9)
Household Income, No. (%)		Some College or Tech	314 (49.3)
<\$25k	196 (30.8)	College Degree or More	126 (19.8)
\$25k to less than \$50k	218 (34.2)	Cigarettes per Day, mean (SD)	15.61 (9.1)
\$50k to less than \$75k	107 (16.8)	Ethnicity, No. (%)	
>\$75k	87 (13.7)	Non-Hispanic	547 (85.9)
Did Not Reply	29 (4.6)	Hispanic	90 (14.1)

Absolute Risk E-Cig, mean (SD)	4.68 (2.7)	Absolute Risk Cig, mean (SD)	8.29 (2.2)
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RESULTS: RELATIVE RISK PERCEPTIONS

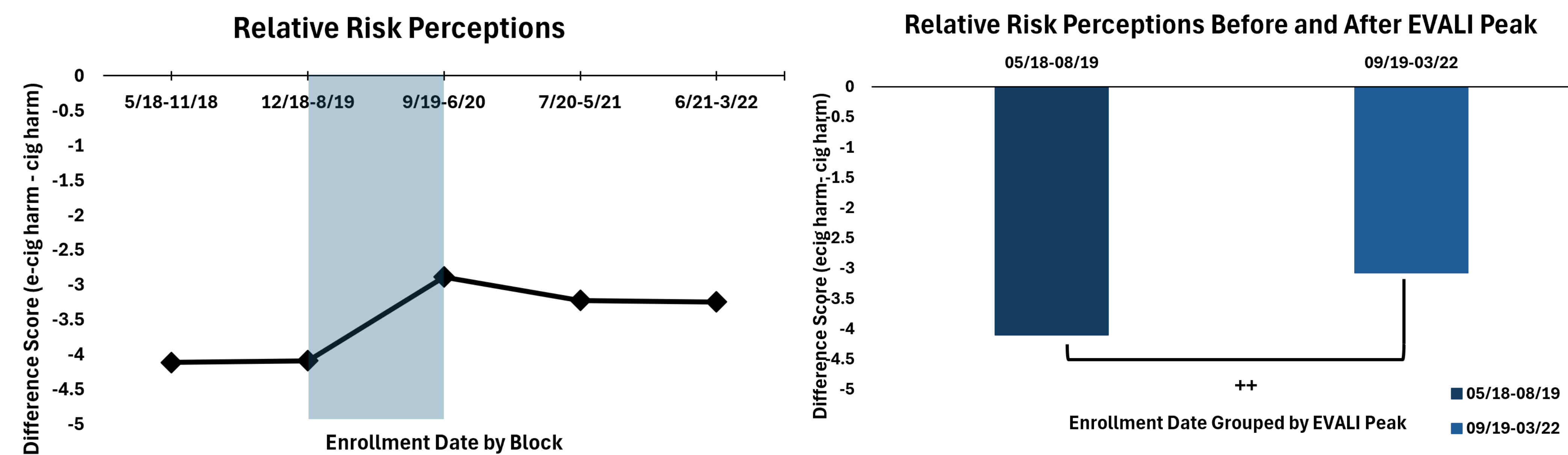


Figure 1. There was a significant effect of enrollment date block ($p < 0.05$). Follow up comparisons between enrollment blocks (vs. block 3) revealed that Blocks 1 and 2 were significantly different from Block 3 ($MD=1.2, p < 0.05$; $MD=1.2, p < 0.05$, respectively). **EVALI falls within shaded region.**

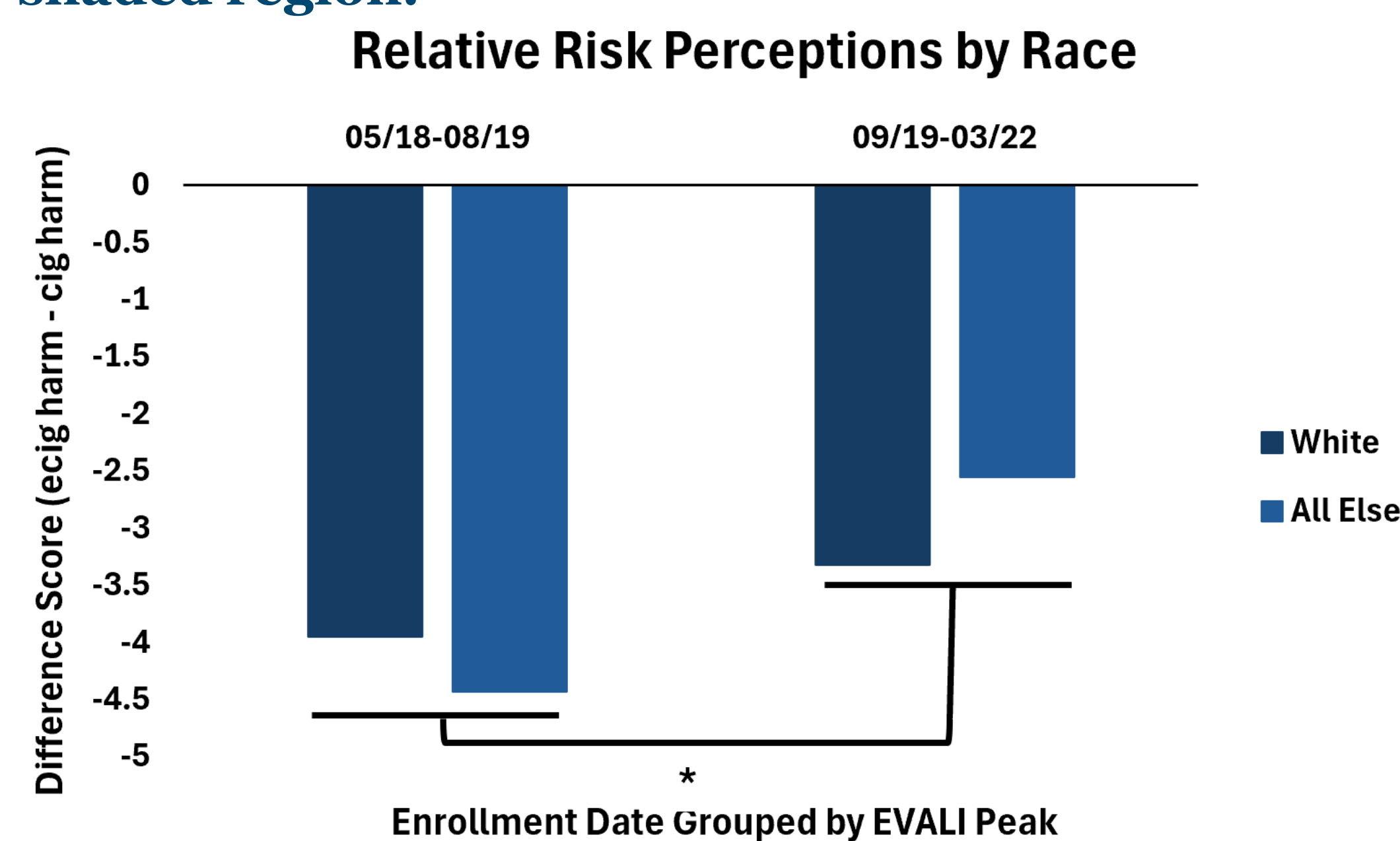


Figure 3. There was a significant interaction between race and enrollment date on risk perceptions ($p < 0.05$) such that relative risk scores for non-white participants increased more after the EVALI peak than relative risk scores for white participants.

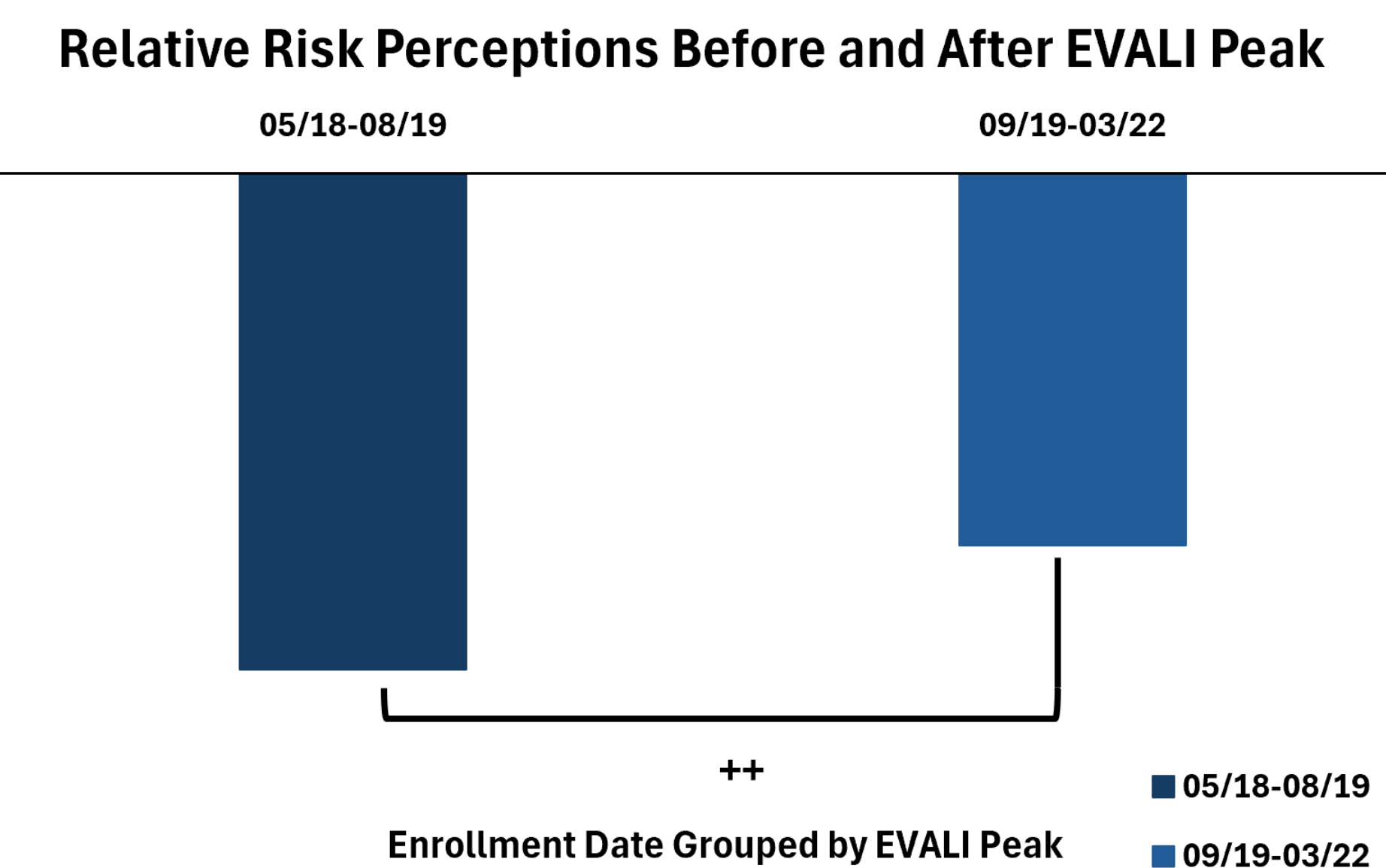


Figure 2. Because blocks 1 and 2 were significantly different from block 3, in interaction tests Blocks 1 and 2 were combined and Blocks 3, 4, and 5 were combined to create a time variable with two levels (before EVALI, after EVALI). There was a significant effect of the two levels ($p < 0.001$) such that relative risk scores were higher after the EVALI peak.

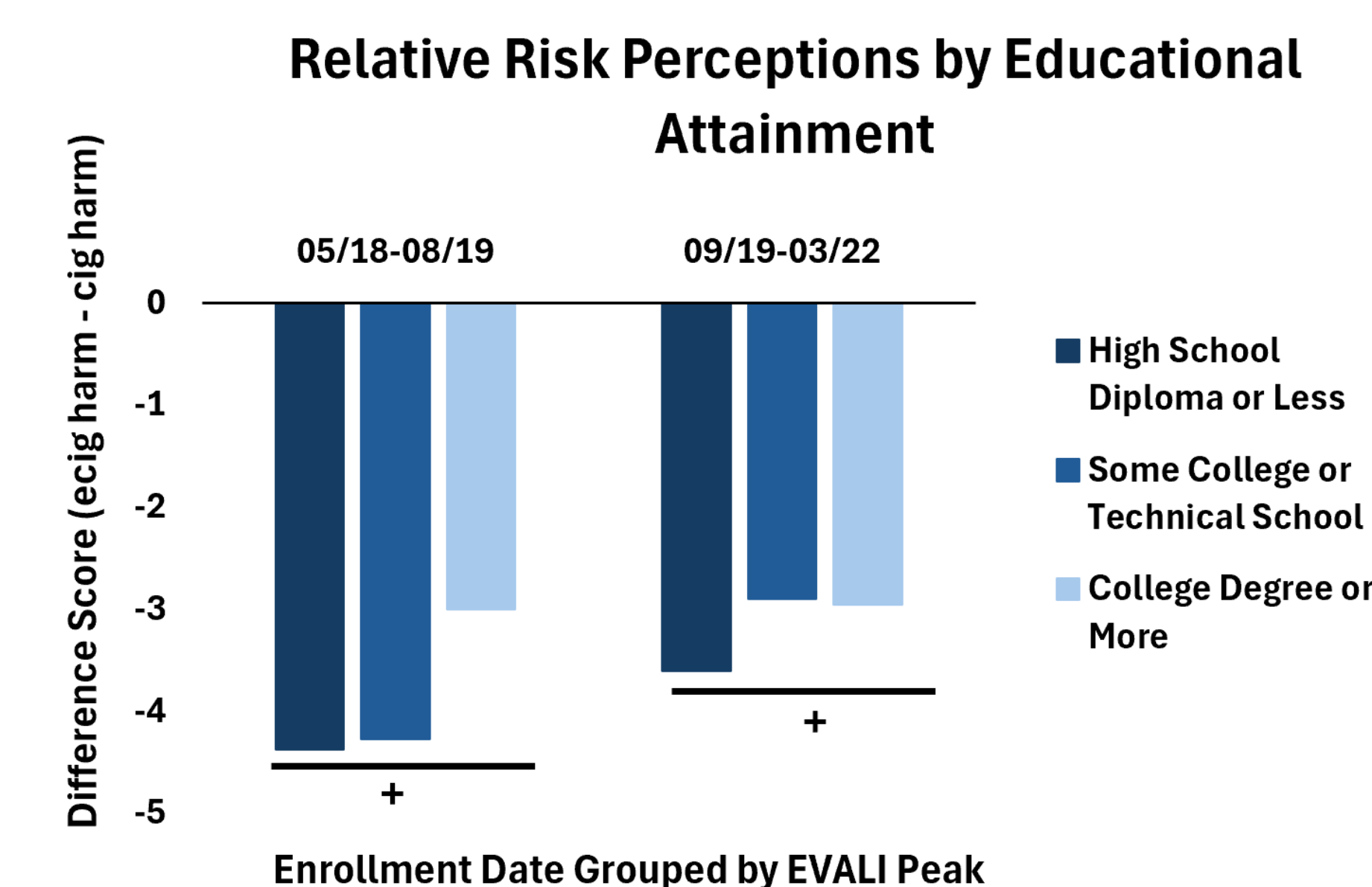


Figure 4. There was a significant main effect of educational attainment on risk perceptions ($p < 0.05$) such that higher educational attainment was associated with higher relative risk scores, but the interaction between educational attainment and enrollment date on risk perceptions did not reach significance ($p = 0.052$).

RESULTS

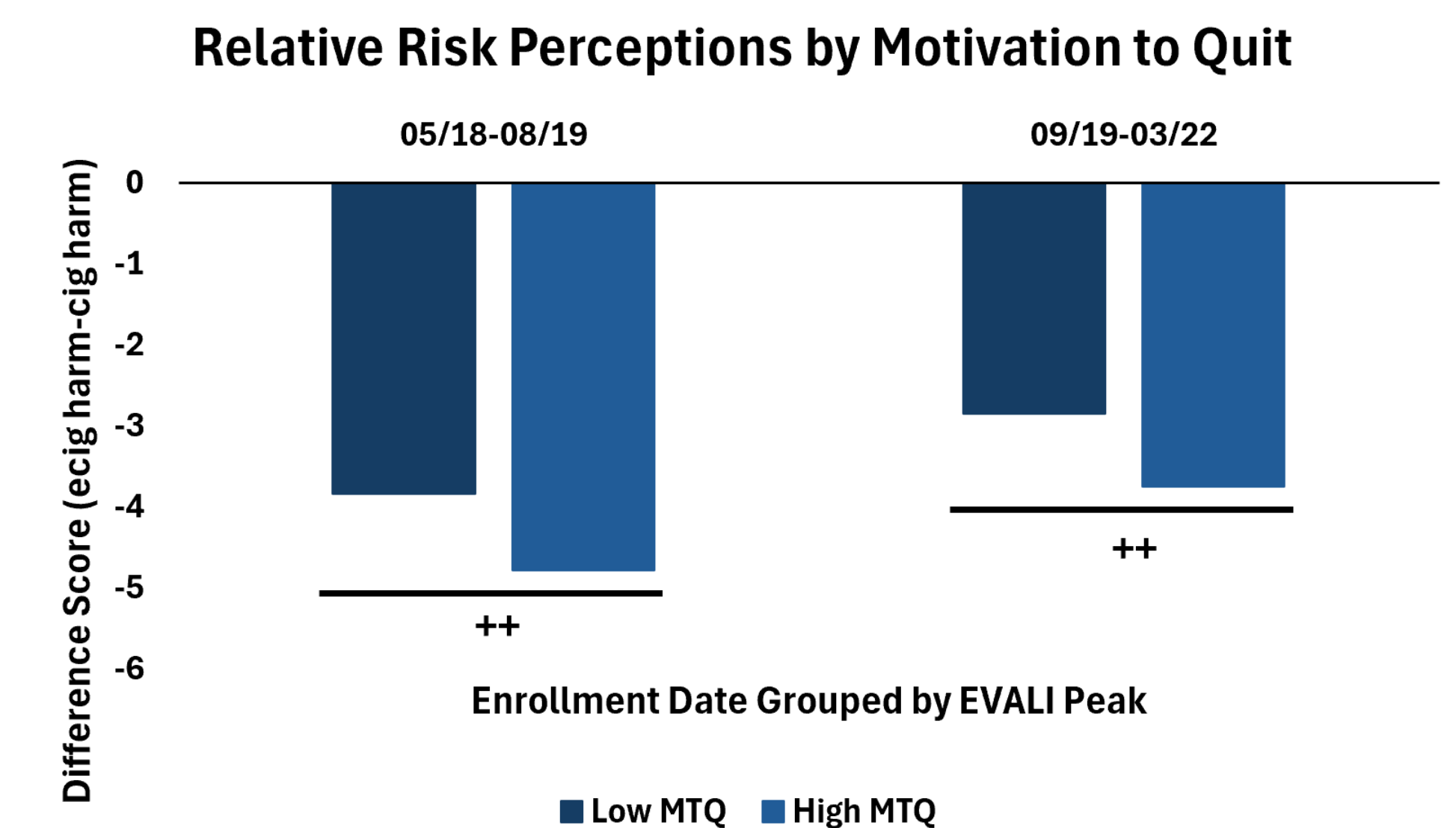


Figure 5. There was a significant main effect of motivation to quit on risk perceptions ($p < 0.001$) such that lower MTQ was associated with higher relative risk scores, but there was no significant interaction between motivation to quit and enrollment date on risk perceptions ($p > 0.05$).

- No other statistically significant comparisons were made.

DISCUSSION

- Relative risk perceptions for e-cigarettes changed over the course of enrollment for this study. Results suggest that e-cigarette or vaping product use-associated lung injury (EVALI) may have impacted relative risk perceptions for e-cigarettes.
- E-cigarette relative risk perceptions were never found to be as or more harmful than cigarettes in contrast to prior literature.
- Participants in this study enrolled, in part, due to an interest in e-cigarettes and this may have contributed to why e-cigarette harm perceptions never reached that of cigarettes.
- Non-white smokers were more likely to have a change in relative risk perceptions over time of enrollment. Smokers with higher educational attainment and smokers with a lower motivation to quit were more likely to have higher relative risk perceptions of e-cigarettes.
- Other demographic differences in risk perceptions noted in prior literature were not found in these results.

FUTURE DIRECTIONS

- There is a need to continue to monitor risk perceptions of e-cigarettes among smokers as they may present as a less harmful alternative to combustible cigarettes.
- Future analyses of this study should investigate the role e-cigarette uptake has on risk perceptions and whether differences are noted based on demographics.
- Additional data collection is needed to determine the potential lasting effects of EVALI on relative risk perceptions.

REFERENCES



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