Online Supplemental Material for The Peril of Opioid Stigma Peril: Experimental Evidence for Removing Danger-Based Health Appeals

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Opioid Type

Opioid type was originally explored as a primary variable of interest in this study given emerging research suggesting differences in stigma perceptions based on opioid type. For example, individuals whose OUD begins with a prescription but transitions to heroin have been rated as more dangerous than individuals who never develop a heroin problem (Goodyear & Chavanne, 2021). Stigma ratings also rise when a person obtains an opioid illegally rather than from a doctor (Goodyear et al., 2018; Ragsdale & Elliot, 2022). Heroin and fentanyl similarly prompt stronger perceptions of dangerousness (Goodyear et al., 2022) and may change how strongly a stigma message prompts stigma responses. Since research is still emerging on these differences, this study sought to answer the question: *How, if at all, will opioid type moderate any of the relationships between opioid stigma peril and (a) stigma beliefs, (b) negative emotions, (c) desired social distance, (c) desire for behavioral regulation, (d) support for prosocial public health policies, and (e) stigma message sharing intentions?*

Given that results to this research question did not reveal major findings, the results were moved to online supplemental material. In the current study, opioid type only minorly affected two study mediators: stigma beliefs and disgust (Table 2). Post-hoc Tukey tests revealed that individuals in the heroin conditions expressed greater stigma beliefs (M = 4.38, SD = 1.48) than individuals in the prescription opioid conditions (M = 3.89, SD = 1.46). Individuals in the fentanyl conditions also expressed significantly greater disgust (M = 2.62, SD = 1.80) than individuals in the prescription opioid conditions (M = 2.03, SD = 1.50).

These findings add to the growing body of research suggesting that people express stronger stigma perceptions for opioids like heroin and fentanyl (Goodyear & Chavanne, 2021; Goodyear et al., 2022). However, opioid type exerted no other direct or moderating effects in the study and did not affect any of the four study outcomes. It is possible that the smaller sample size of the study limited the ability to observe significant effects. Alternatively, opioid stigma could be so pervasive that no matter the type of opioid, stigma messages about opioids will prompt more harmful stigma attitudes and behaviors. Future work should continue to investigate the role of opioid type in the stigma effects process. These studies might particularly examine the intersection of opioid type and race given research suggesting that framing of the prescription opioid epidemic as a white epidemic has shifted how people stigmatize opioid use (Mendoza et al., 2019).

Table S1

Demographic Characteristics of Sample

Characteristic	***M***	***SD***
Age	41.29	13.04
	N	**Percent**
Gender		
Cisgender man	177	48.6%
Cisgender woman	170	46.7%
Gender non-binary or transgender	2	0.5%
No response	15	4.1%
Race and Ethnicity		
American Indian or Alaskan Native	4	1.1%
Asian	23	6.3%
Black or African American	38	10.4%
Caucasian	258	70.9%
Hispanic or Latino/Latinx	9	2.5%
Multiple races or ethnicities	15	4.1%
Other	2	0.5%
No response	15	4.1%
Education		
Nursery school to 8th grade	1	0.3%
Some high school, no diploma	1	0.3%
High school graduate, diploma, or equivalent (e.g., GED)	37	10.2%
Some college credit, no degree	40	11.0%
Trade/technical/vocational training	9	2.5%
Associate degree	36	9.9%
Bachelor's degree	170	46.7%
Master's degree	50	13.7%
Professional degree (e.g., medicine, theology, law)	2	0.5%
Doctorate degree	6	1.6%
No response	12	3.3%

Table S2

Stigma Peril Messaging in Experimental Conditions

Low Stigma Peril	High Stigma Peril
Sam is personally affected by the physical, social, and mental consequences of Sam's [opioid type] problem.	The people in Sam's life are affected by the physical, social, and mental consequences of Sam's [opioid type] problem.
Sam's story should serve as an invitation to us all to support Sam through his recovery.	Sam's story should serve as a warning to us all.

Table S3

Conditional Indirect Effect of Peril on Outcomes through Disgust and Stigma Beliefs

Outcome Variable	*Moderated Mediation Index*	*SE*	95%*CI*	*W Level*	*b*	*SE*	95%*CI*
Social Distance (R^2 = .44*****)**							
Disgust				*Experience*			
W1	-.45	.31	[-1.07, .14]	None (0)	-.14	.17	[-.46, .19]
W2	-.13	.40	[-.92, .66]	Affiliate (1)	-.59*	.26	[-1.11, -.11]
				Personal (2)	-.27	.36	[-.98, .45]
Stigma Beliefs				None (0)	.27	.17	[-.06, .61]
W1	-.14	.28	[-.69, .40]	Affiliate (1)	.13	.22	[-.29, .56]
W2	.07	.29	[-.49, .64]	Personal (2)	.34	.23	[-.11, .80]
Behavioral Regulation (R^2 = .64*****)**							
Disgust				*Experience*			
W1	.06	.04	[-.01, .15]	None (0)	.02	.02	[-.03, .07]
W2	.02	.05	[-.09, .12]	Affiliate (1)	.08*	.04	[.01, .17]
				Personal (2)	.03	.05	[-.06, .14]
Stigma Beliefs				None (0)	.28	.17	[-.07, .62]
W1	-.15	.29	[-.70, .45]	Affiliate (1)	.13	.23	[-.31, .61]
W2	.07	.30	[-.52, .67]	Personal (2)	.36	.25	[-.12, .85]
Support for Opioid-Related Policies (R^2 = .15*****)**							
Disgust				*Experience*			
W1	-.06	.05	[-.17, .02]	None (0)	-.02	.02	[-.07, .02]
W2	-.02	.05	[-.14, .09]	Affiliate (1)	-.07*	.05	[-.18, -.003]
				Personal (2)	-.03	.05	[-.15, .06]
Stigma Beliefs				None (0)	-.06	.04	[-.15, .01]
W1	.03	.06	[-.08, .17]	Affiliate (1)	-.03	.05	[-.13, .07]
W2	-.01	.06	[-.14, .11]	Personal (2)	-.07	.06	[-.19, .02]
Stigma Message Sharing (R^2 = .29*****)**							
Disgust				*Experience*			
W1	.36	.24	[-.10, .83]	None (0)	.11	.13	[-.16, .36]
W2	.10	.32	[-.48, .76]	Affiliate (1)	.47*	.20	[.10, .86]
				Personal (2)	.21	.28	[-.34, .81]
Stigma Beliefs				None (0)	-.08	.06	[-.23, .02]
W1	.04	.09	[-.12, .23]	Affiliate (1)	-.04	.07	[-.18, .09]
W2	-.02	.09	[-.20, .17]	Personal (2)	-.10	.08	[-.28, .03]

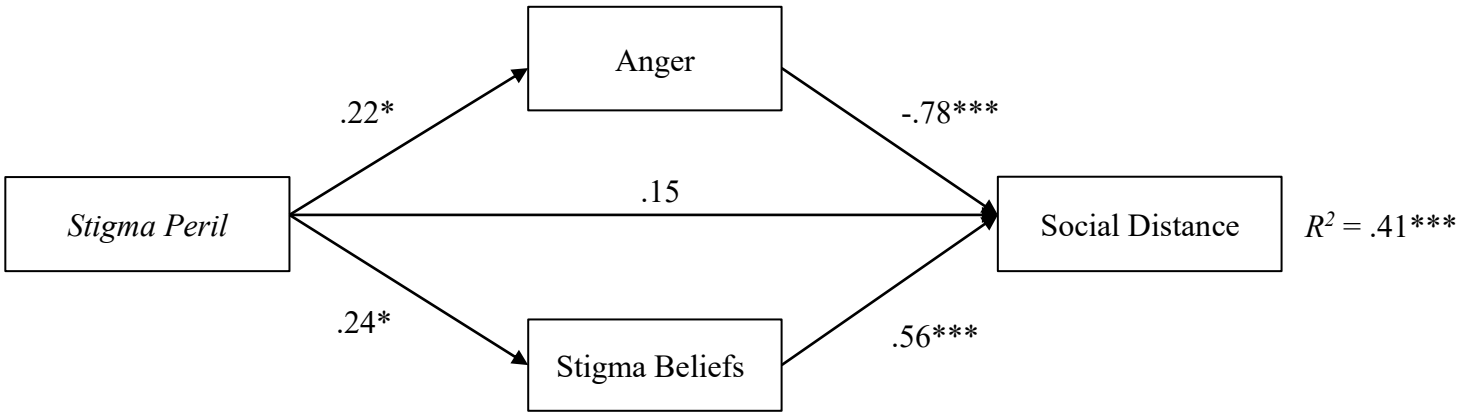
Note. Table represents conditional indirect effect findings from four different moderated mediation models, one for each of the four study outcomes. Opioid type was entered as a

covariate into all models. All variables that define continuous product terms were also mean centered. Since the moderator is a categorical moderator, PROCESS codes two interaction terms, W1, or the comparison of individuals with level 1 (affiliate experience) to the other groups, and W2, or the comparison of individuals with level 2 (personal experience) to the other groups.

*$p < .05$, **$p < .01$, *** $p < .001$.

Figure S1

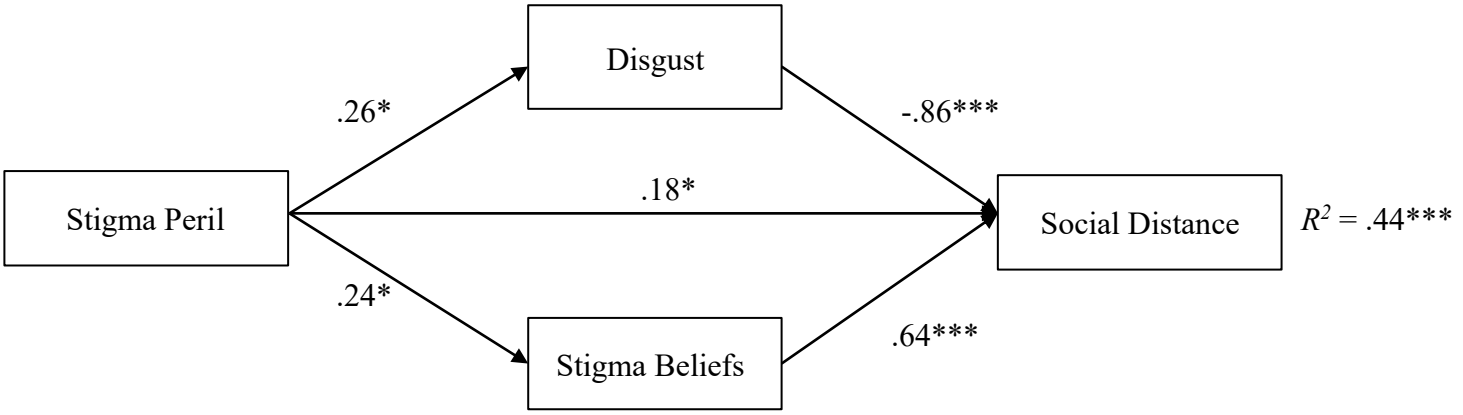
Dual Mediation of Stigma Peril on Social Distance through Anger and Stigma Beliefs



Note. Standardized coefficients are used in the figure. Opioid type was also entered as a covariate in the model. *p < .05, **p < .01, *** p < .001.

Figure S2

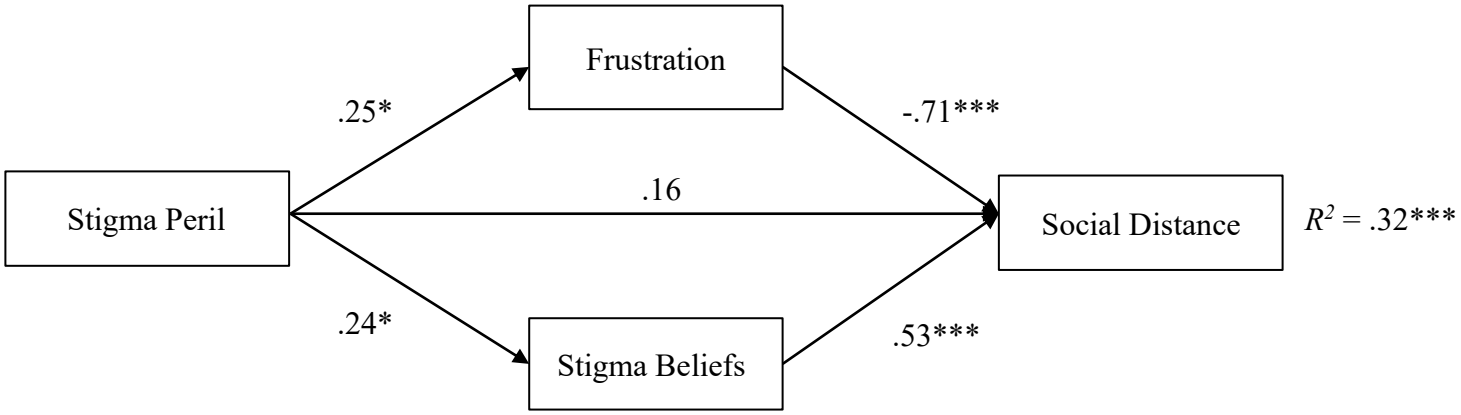
Dual Mediation of Stigma peril on Social Distance through Disgust and Stigma Beliefs



Note. Standardized coefficients are used in the figure. Opioid type was also entered as a covariate in the model. *p < .05, **p < .01, *** p < .001.

Figure S3

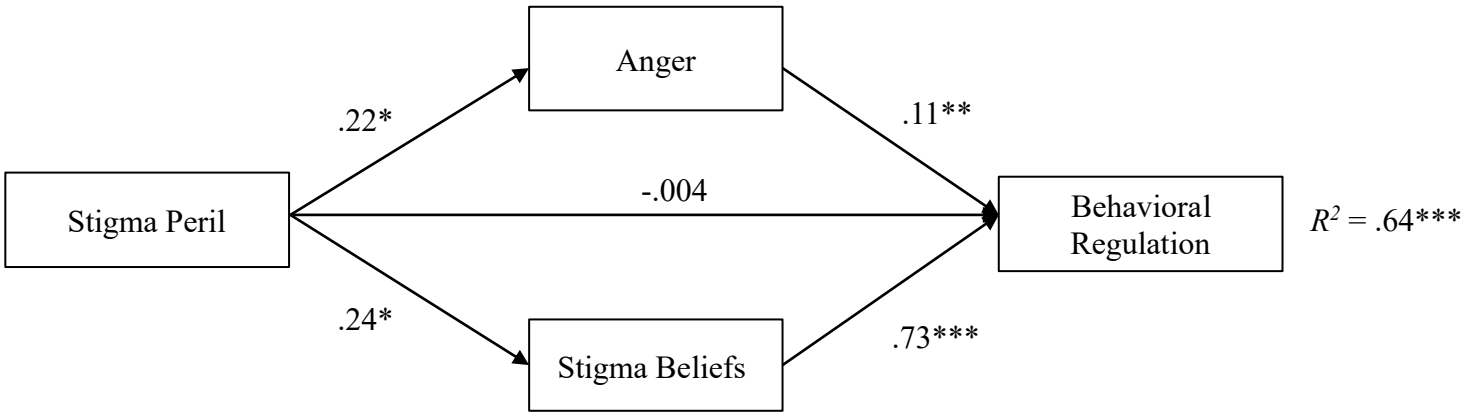
Dual Mediation of Stigma peril on Social Distance through Frustration and Stigma Beliefs



Note. Standardized coefficients are used in the figure. Opioid type was also entered as a covariate in the model. *p < .05, **p < .01, *** p < .001.

Figure S4

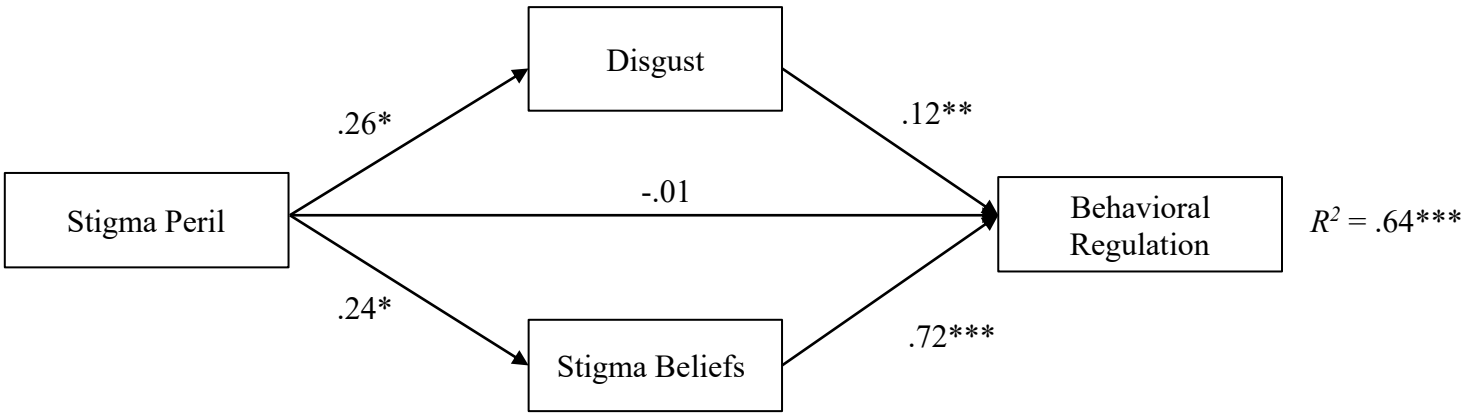
Dual Mediation of Stigma peril on Behavioral Regulation through Anger and Stigma Beliefs



Note. Standardized coefficients are used in the figure. Opioid type was also entered as a covariate in the model. *p < .05, **p < .01, *** p < .001.

Figure S5

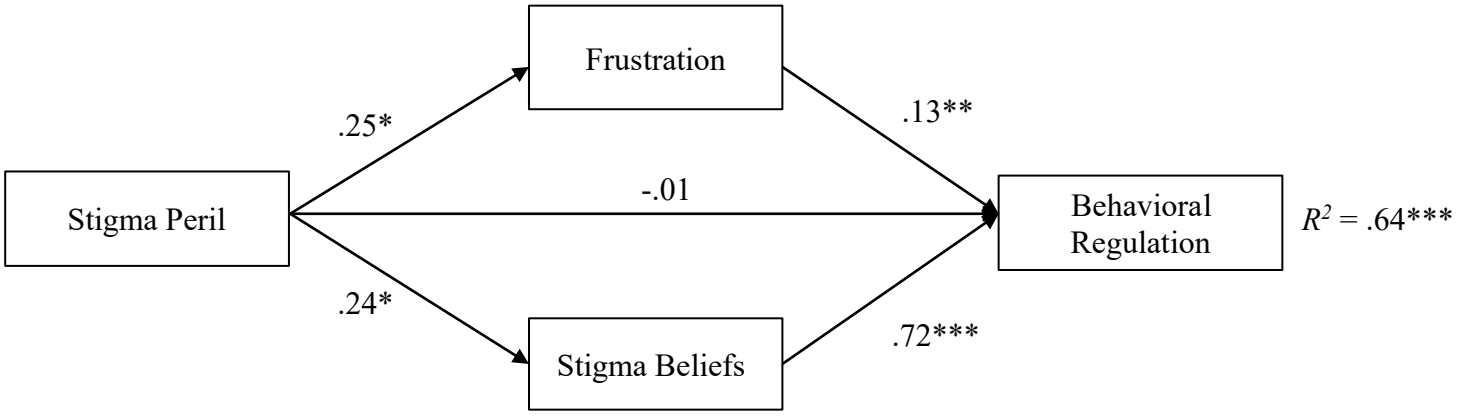
Dual Mediation of Stigma peril on Behavioral Regulation through Disgust and Stigma Beliefs



Note. Standardized coefficients are used in the figure. Opioid type was also entered as a covariate in the model. *p < .05, **p < .01, *** p < .001.

Figure S6

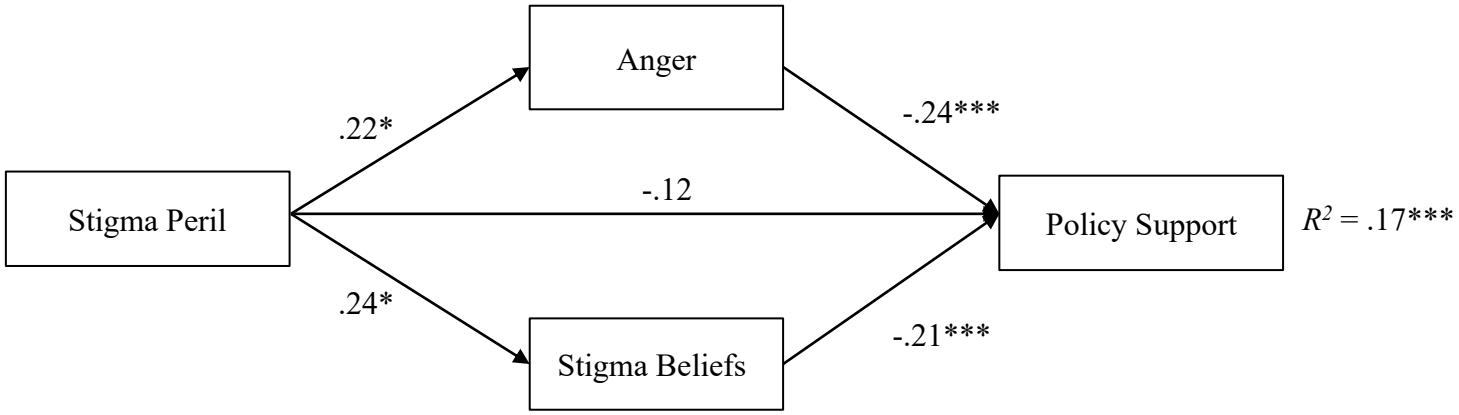
Dual Mediation of Stigma peril on Behavioral Regulation through Frustration and Stigma Beliefs



Note. Standardized coefficients are used in the figure. Opioid type was also entered as a covariate in the model. *p < .05, **p < .01, *** p < .001.

Figure S7

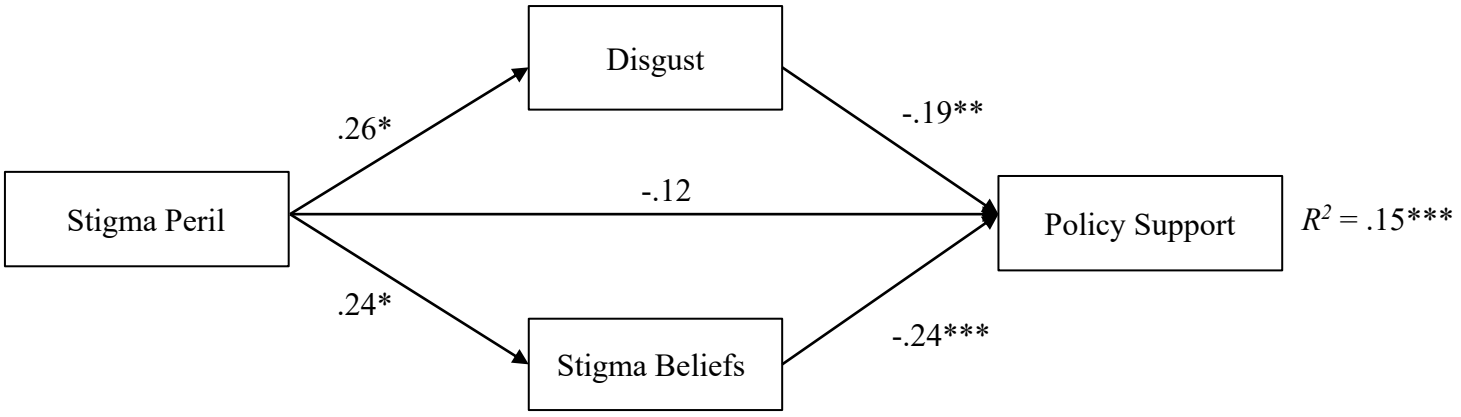
Dual Mediation of Stigma peril on Opioid-Related Policy Support through Anger and Stigma Beliefs



Note. Standardized coefficients are used in the figure. Opioid type was also entered as a covariate in the model. *p < .05, **p < .01, *** p < .001.

Figure S8

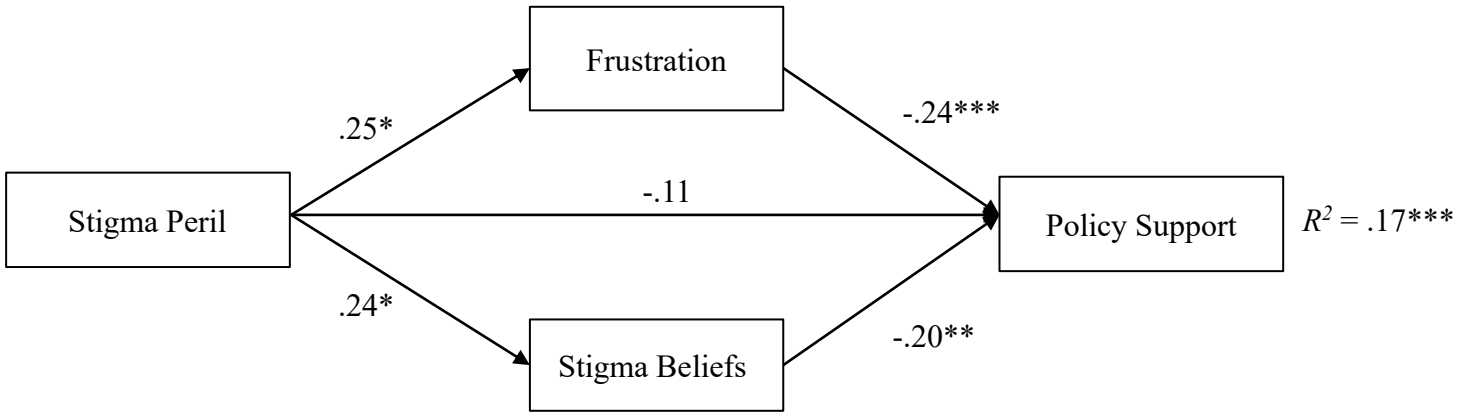
Dual Mediation of Stigma peril on Opioid-Related Policy Support through Disgust and Stigma Beliefs



Note. Standardized coefficients are used in the figure. Opioid type was also entered as a covariate in the model. *p < .05, **p < .01, *** p < .001.

Figure S9

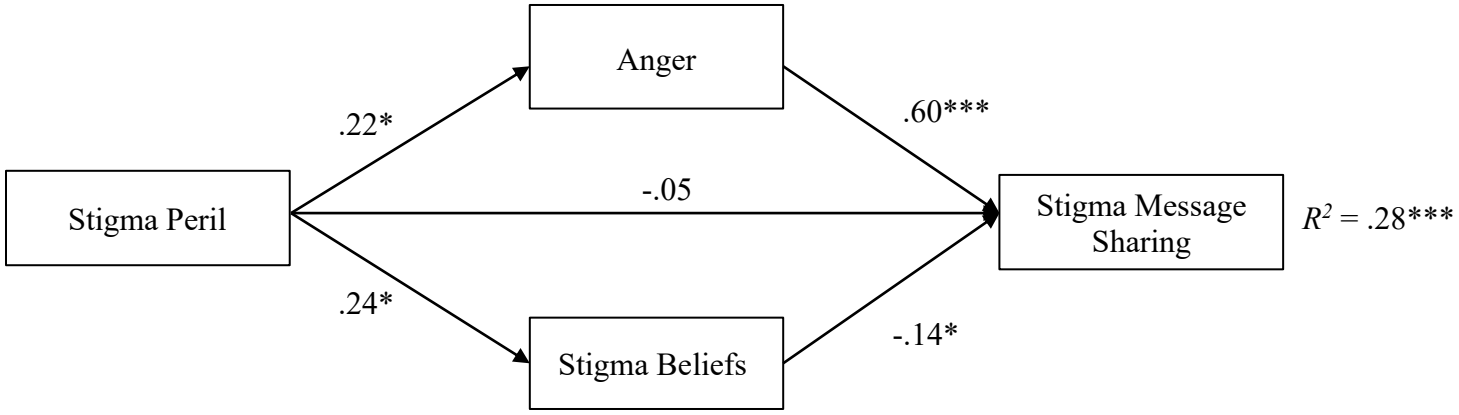
Dual Mediation of Stigma peril on Opioid-Related Policy Support through Frustration and Stigma Beliefs



Note. Standardized coefficients are used in the figure. Opioid type was also entered as a covariate in the model. *p < .05, **p < .01, *** p < .001.

Figure S10

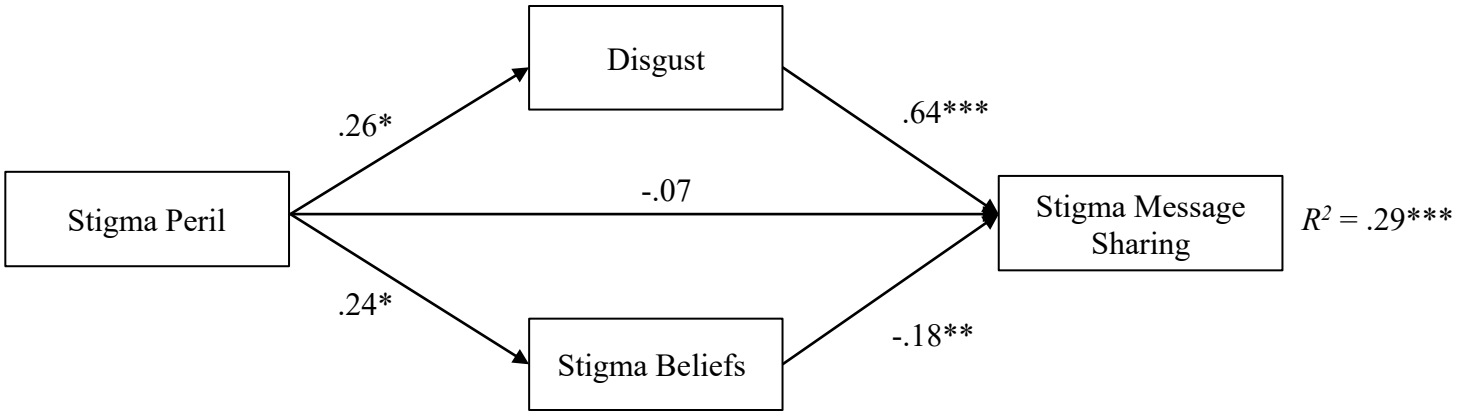
Dual Mediation of Stigma peril on Stigma Message Sharing through Anger and Stigma Beliefs



Note. Standardized coefficients are used in the figure. Opioid type was also entered as a covariate in the model. *p < .05, **p < .01, *** p < .001.

Figure S11

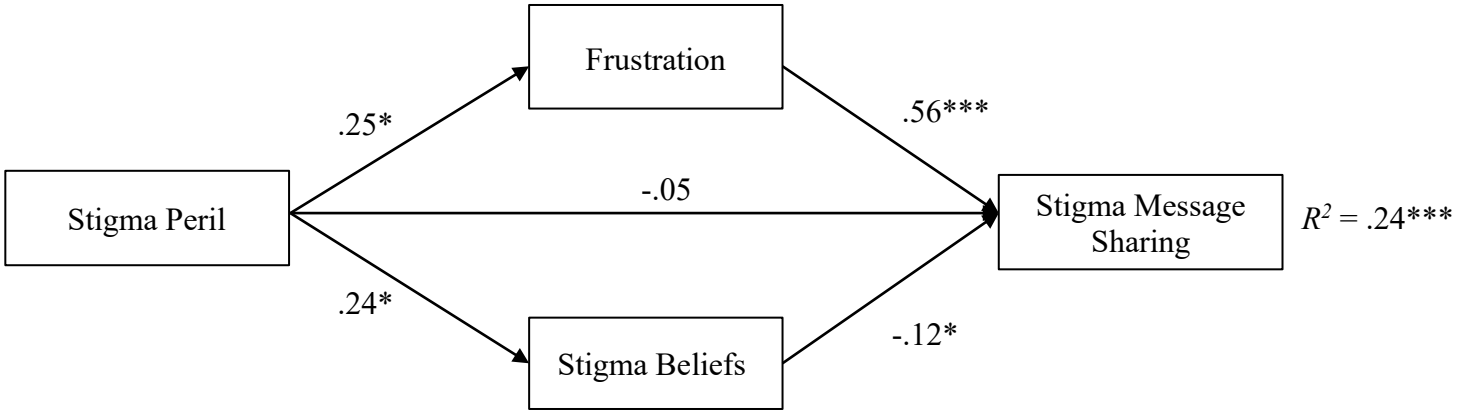
Dual Mediation of Stigma peril on Stigma Message Sharing through Disgust and Stigma Beliefs



Note. Standardized coefficients are used in the figure. Opioid type was also entered as a covariate in the model. *p < .05, **p < .01, *** p < .001.

Figure S12

Dual Mediation of Stigma peril on Stigma Message Sharing through Frustration and Stigma Beliefs



Note. Standardized coefficients are used in the figure. Opioid type was also entered as a covariate in the model. *p < .05, **p < .01, *** p < .001.