DOI: 10.1111/pops.70051

ORIGINAL ARTICLE

Political Psychology

Individual differences in aesthetic experience point to the role of bodily awareness in political orientation

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Funding information
YSF Innovation Fund; Tiny Blue Dot Foundation, Grant/Award Number: E4001; Joy Ventures research grant; BeSound SAS; Nested Minds LTD; European Commission and the French Ministry of Armed Forces (AID)

Abstract

Aesthetic chills are a peak response characterized by shivers and goosebumps in response to stimuli such as music or speech. In a previous study of 2947 California participants, conservatives and liberals reported experiencing chills with similar frequency when exposed to prevalidated audiovisual stimuli, but conservatism was associated with more intense chills. The present preregistered study examines whether this correlation was due to religiosity and/or being among a cultural minority (conservative within a progressive context), by assaying matched politically diverse populations in California ($n = 620$) and Texas ($n = 262$) while testing for religiosity and interoceptive awareness, based on links between conservatism and disgust sensitivity. The originally observed positive correlation between chills intensity and conservatism was replicated, did not show an effect of location, and appears strongly mediated by trait absorption, religiosity, and prestimulus mood. Post hoc analyses of nonlinear trends suggested that interoceptive awareness and chills intensity covary with distance from the political center, that is, extremism, rather than conservatism per se. This work suggests that heightened physiological/visceral intensity of experience may partly underlie political extremism and supports the utility of aesthetic responses as a tool to identify and even alter belief structures, including those underlying political world views.

KEYWORDS

aesthetic chills, conservatism, interoception, liberalism, political orientation, religiosity

Significance Statement

This study finds that religiosity and interoceptive awareness act as key mediators in the relationship between political orientation and the intensity of aesthetic chills. Religiosity, which covaries linearly with conservatism, and interoceptive awareness, associated with political extremity, shape the intensity of embodied aesthetic responses. This research challenges unidirectional models of political ideology influencing emotion, instead suggesting a dynamic interplay between bodily awareness and political extremes. Embodied affective responses to aesthetic stimuli may aid in elucidating the complex interplay between political orientation, religiosity, and embodiment.

INTRODUCTION

Aesthetic chills are a peak emotional response to discrete stimuli characterized by changes in physiology, such as shivers, goosebumps, and associated sensations such as chills (Benedek & Kaernbach, 2011; Bignardi et al., 2022; Mori & Iwanaga, 2014; Schoeller et al., 2023a, 2024; Schoeller & Perlovsky, 2016). The factors that lead to chills are multifaceted and diverse, encompassing a range of emotional and cognitive triggers.

Chills can arise from intensely negative triggers, such as betrayal of trust, suspicion of motives, or outgroup interactions as well as from positive sources such as social approval and inspiration (Christov-Moore et al., 2024; Leander et al., 2013; Levenson et al., 2005; Thrash et al., 2014). Some research has demonstrated subjective and biological differences between chills from negative and from positive triggers (Maruskin et al., 2012), as well as some varieties of chills with a more mixed orientation reflecting experiences such as awe and self-transcendence (Bannister, 2019; Bannister et al., 2023).

Aesthetic chills in the context of self-transcendence and awe can indicate downstream effects on pro-sociality (Fukui & Toyoshima, 2014a, 2014b). Physiological evidence suggests that broadly, chills may be linked to intense and cognitively complex emotional experiences, with these sources of this complexity being as varied as social expectations, self-relevance, and mixes of positive and negative sentiment (Mori & Iwanaga, 2014; Sumpf et al., 2015). In the presence of these strong sources of emotional information, embodied responses and interoception can be key mechanisms for evaluating the emotional context and subsequent approach or avoid motivations (Jain et al., 2023; Maruskin et al., 2012; Schoeller et al., 2024).

Political orientation has been frequently linked with chill responses, as it allows for a framework to understand the emotional and social concerns specific to individuals, and broader patterns of embodied cognition, which shape when people experience chills. For example, liberal and conservative political tendencies have been frequently associated with several underlying character traits, including an intriguing relationship with visceral/disgust responses (thought to underlie purity/degeneracy concerns) (Smith et al., 2011; Tybur et al., 2010; Xu et al., 2020). Fear sensitivity, even as early as age 4, has been shown to predict future conservatism, suggesting that trait differences in bodily responses to emotional triggers may underlie political mindsets (Block & Block, 2006). Disgust sensitivity, particularly concerning purity and contamination concerns, is another robust predictor of conservatism, reflecting underlying concerns about maintaining social and moral order (Smith et al., 2011; Tybur et al., 2010). Similarly, religiosity, which has often been associated with conservatism in the United States and elsewhere (O'Brien & Abdelhadi, 2020;

Ozmen et al., 2018), has also been suggested to be shaped by patterns of embodied response to emotionally intense stimuli (Soliman et al., 2015; Van Elk & Aleman, 2017). Intuitively, religiosity has been related to the ability to be moved by awe-inducing or spiritual experiences and may underlie conservatives' resistance to societal change and maintenance of traditional spiritual values (Hirsh et al., 2013).

In a recent study, we found robust correlations between aesthetic chills and political conservatism in a sample of Californians (Christov-Moore et al., 2024). Specifically, conservatives reported more intense chills, though not a greater likelihood of chills. While previous literature suggests this relationship may be driven by underlying common response patterns associated with conservatism, chills and self-transcendent experience may also represent a context-specific trend reflecting the position of the original cohort's orientation relative to the social and cultural context of California, which trends liberal (Reynolds, 2013). This social factor may reinforce the patterns of embodied responses in conservatives. However, another source of this variance, which would differ less state to state, may be the underlying differences in religiosity, which also shape chills and self-transcendent responses. We sought to disentangle this relationship by replicating our study in diverse, matched cohorts in California and Texas. Texas, like California, is a diverse, economically powerful, large state but differs in its more conservative cultural hegemony (Cultural Currents Institute, 2023). Furthermore, we expanded our inquiry to include religiosity and self-reported interoceptive awareness, which serves as a proxy for heightened visceral awareness or sensitivity. While these were our preregistered variables of interest, several factors merit additional consideration for explaining this association. Demographic aspects such as age, gender, and ethnicity are also significant in understanding the experience of chills (Schoeller et al., 2024). Emotional context (how the participant is feeling at baseline), such as arousal, has a predictive role in these experiences (Christov-Moore et al., 2024; Mori & Iwanaga, 2014; Schoeller et al., 2024). These factors were also examined to control for their possible role relative to the principal hypothesis testing.

METHODS

Design

The following reflects the details of our preregistration (housed along with data at https://osf.io/x3wkv). This experiment followed a between-subjects design with two groups and one factor (political orientation) with seven levels (very liberal, moderately liberal, slightly liberal, moderate, slightly conservative, moderately conservative, very conservative), conducted via a survey study of two racially/ethnically diverse, politically diverse, and gender-balanced groups ($n = 882$), conducted using the Qualtrics platform in two sampling regions: Southern California ($n = 621$) and Central Texas ($n = 261$). Each participant was pseudorandomly assigned to view one of four al stimuli from the ChillsDB 2.0 database of previously validated aesthetic chills-inducing stimuli (Schoeller et al., 2023b): "Hallelujah!" (audiovisual or audio-only), "Great Dictator" (audiovisual or audio-only). "Hallelujah!" is a live recording of the singer Rufus Wainwright singing Leonard Cohen's "Hallelujah" with choral backing from over 1000 audience members, while "Great Dictator" is Charlie Chaplin's iconic anti-fascist speech about human freedom from the movie by the same name, set to a moving score; for any "audio-only" stimulus, the screen was black. Pseudonymization was performed such that each video was viewed by a similarly diverse group of participants in each location (63 per video in Texas, 157 per video in California).

Participants began by reporting on their demographic characteristics: age, race, ethnicity, gender identification, education level, political orientation, and religiosity. They then

filled out a series of trait questionnaires: KAMF (Kama-Meta Frequency Scale; Zickfeld et al., 2019); NEO-FFI (Big-Five Personality Scale; Costa & McCrae, 1992); MODTAS (modified Tellegen absorption scale; Tellegen & Atkinson, 1974); DPES (disposition to positive emotions scale; Shiota et al., 2006); MAIA (multidimensional assessment of interoceptive awareness; Mehling et al., 2015). After, they reported their affective state: arousal, valence, and mood using a visual scale. Afterward, they were asked to view one of the four stimuli. Following stimulus viewing, participants were queried on their affective state (arousal, valence, mood); whether they liked the video; whether they had seen the video before; whether they experienced chills; how intensely they experienced chills (0–100); and whether they experienced goosebumps. Last, they filled out three questionnaires measuring facets of self-transcendence: ego dissolution (Ego Dissolution Index; Nour, et al., 2016); connectedness (the Watts Connectedness Scale, Watts et al., 2022); and moral elevation (State Moral Elevation Scale; McGuire et al., 2022).

Participants

882 participants (481 females) were sampled from two populations: Southern California and Central Texas. Participants volunteered for and were recruited via the Qualtrics platform and were pseudorandomly assigned such that each group of participants viewing each video in each location were matched for representative makeup of gender, ethnicity, and distribution of political orientations. Participants were paid $8 for up to 40 min of participation (~$12/h). Participants had to be at least 18 years old and residents of either Southern California or Central Texas.

Materials

The dispositional positive emotion scale (DPES)

The DPES (Shiota et al., 2006) measures one's dispositional tendencies to feel positive emotions toward others in their daily lives. The DPES consists of seven subscales, which measure one's temperament regarding joy, contentment, pride, love, compassion, amusement, and awe. The scale comprises a total of 38 items, with each subscale containing 5 or 6 items. Participants rate their agreement with statements such as "On a typical day, many events make me happy" on a 7-point Likert scale ranging from "1—strongly disagree" to "7—strongly agree." The total score is obtained by averaging the item responses, yielding a range from 1 to 7, with higher scores indicating greater levels of positive emotion.

NEO-five-factor inventory (NEO-FFI-3)

The NEO-FFI-3 (Costa & McCrae, 1992) is a widely used personality assessment tool based on the five-factor model (FFM) of personality. It is designed to measure five broad dimensions of personality: neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness. The NEO-FFI-3 consists of 60 items, with 12 items for each of the five personality factors. Participants respond to statements such as "I worry a lot" or "I am talkative" on a 5-point Likert scale, indicating the extent to which each statement reflects their personality traits (1 = not at all, to 5 = very much). The NEO-FFI-3 provides researchers and practitioners with a concise and reliable measure of the key dimensions of personality, allowing for a comprehensive understanding of individuals' typical patterns of behavior, emotions, and cognition.

Modified Tellegen absorption scale (MODTAS)

The Tellegen Absorption Scale (TAS) is a 34-item multidimensional measure that assesses imaginative involvement and the tendency to become mentally absorbed in everyday activities (Tellegen & Atkinson, 1974). We employed a modified version, the MODTAS (Jamieson, 2005), which has a Likert-scaled response format and a clearer covariance structure than the original TAS (Jamieson, 2005). Subjects are asked to rate the frequency of their experiences on a 5-point scale, ranging from 0 (never) to 4 (very often). It consists of five correlated primary factors: Synesthesia, Altered States of Consciousness, Aesthetic Involvement in Nature, Imaginative Involvement, and apparent experiences of Extra Sensory Perception (Jamieson, 2005).

Kama Muta frequency scale (KAMF)

This 7-item scale (Zickfeld et al., 2019) measures predisposition for Kama muta, (काममूत in Sanskrit, meaning: 'moved by love') an affective state described as "being moved," "heart-warming," "stirring," or 'being emotionally touched'. Kama muta is a distinct positive social relational emotion, evoked by experiencing or observing a sudden intensification of communal sharing. It motivates affective devotion and commitment to community sharing. The construct has been validated with studies in 15 languages, over 19 countries, across 5 continents (Zickfeld et al., 2019). It is commonly accompanied by a feeling of warmth in the chest, tears or moist eyes, chills or piloerection, feeling choked up, buoyancy, and exhilaration (Zickfeld et al., 2019).

Ego dissolution inventory (EDI)

The EDI (Nour et al., 2016) consists of 16 items relating to altered ego-consciousness, eight relating to the experience of ego dissolution (comprising the EDI), and eight relating to the antithetical experience of increased self-assuredness, termed ego-inflation. Items are rated using a visual analog scale ranging from 0% to 100%.

Watts connectedness scale (WCS)

The WCS is a new three-dimensional index of felt connectedness that may sensitively measure therapeutically relevant psychological changes postpsychedelic use (Watts et al., 2022). Items cluster into connectedness to self (e.g., "My mind felt connected to my heart/emotion."), connectedness to others (e.g., "I felt connected to friends and/or family."), and connectedness to the wider world and spirituality (e.g., "I felt that everything is interconnected.").

State moral elevation scale (SMES)

The SMES (McGuire et al., 2022) assays positive feelings following the observation of another performing a prosocial act, it consists of nine items assessing, on a Likert-type 5-point scale, the extent to which the participant had different experience, measuring *Emotional Reaction* ("in touch with the better parts of myself"), *Physical Reaction* ("a warm or glowing feeling in my chest"), and *Motivation* ("motivated to live in a nobler or virtuous way"). While not all

stimuli used here had explicitly prosocial acts in them, the wording of this question ("to what extent did you experience each of the following statements while watching the video?") did not preclude nonexplicitly prosocial stimuli and was appropriate to gauge general moral elevation following the specific content of each stimulus.

Multidimensional assessment of interoceptive awareness (MAIA)

The multidimensional assessment of interoceptive awareness (MAIA) is a comprehensive self-report instrument designed to measure interoceptive body awareness (Mehling et al., 2015). The MAIA recognizes several dimensions of this awareness, such as:

1. Noticing: Recognizing bodily sensations
2. Not Distracting: Not ignoring or distracting oneself from sensations of pain or discomfort
3. Not Worrying: Not worrying or experiencing emotional distress with bodily sensations
4. Attention Regulation: Controlling the focus on bodily sensations
5. Emotional Awareness: Awareness of the emotional connection to bodily sensations
6. Self-Regulation: Regulating psychological distress by attention to bodily sensations
7. Body Listening: Actively listening to the body for insight
8. Trusting: Experiencing one's body as safe and trustworthy

The scale includes several items associated with each dimension, and participants rate their experiences on a scale, typically ranging from 0 ("never") to 5 ("always"). The MAIA is a valuable tool for research and clinical settings to assess how individuals perceive and appraise their bodily sensations, which is relevant for conditions like anxiety, depression, and various somatic disorders.

Chills self-report

We employed a 10-item scale to assess participants' emotional valence and arousal. This scale included questions designed to gauge the level of pleasantness and excitement experienced by the participants at the time of assessment ("How pleasant/excited are you feeling right now?"). Chills were self-reported by the participants through a series of questions regarding their emotional and physiological responses to the stimulus. Participants were asked three questions about their chills experience. First, they were asked "Did you experience chills? (Yes/No)," next "How intense were the chills you experienced? (1–10)," and last "What about the experience gave you chills? (open response)." Additionally, a qualitative component involved open-ended responses, asking participants to "please describe your experience during the video," "please describe what caused your chills in the video," and "did the video remind you of a personal experience," providing a deeper qualitative insight into their emotional engagement with the content.

Ethics statement

The experiment complied with the Declaration of Helsinki and the Ethics Code of the American Psychological Association. Following review, the study protocol was granted an exemption status by Advarra IRB (Pro00068209). All participants gave their voluntary informed consent and were informed about the purpose of the research, their right to decline

to participate and to withdraw from the experiment, and the limits of confidentiality. We also provided them with a contact for any questions concerning the research and with the opportunity to ask any questions regarding the phenomenon under study (aesthetic chills) and receive appropriate answers.

Sample size

A total of 960 participants completed this study. About 78 participant data sets were removed prior to analysis due to quality assurance failures, including nonsensical responses, for example, random strings of letters or statements of poor intent ("just give me my money") in qualitative responses, or long stretches of identical responses across multiple measures (indicating failure to consider the measures with care). As such, 882 participants (481 females) were included in the analysis with 621 recruited from California, and 261 recruited from Texas.

Statistical analysis

All analyses were performed using Jamovi (The Jamovi Project, 2022) and Python (3.0) with the sklearn module (Pedregosa et al., 2011).

Preregistered analysis

We employed a two-group, one-factor (seven levels of political orientation) ANCOVA design with 10 covariates (stimulus, location, gender, education, religiosity, MAIA, MODTAS, DPES, KAMF, NEO-FFI). For this main analysis, our sample size of 882 was sufficiently powered to detect even a relatively small main effect of location, religiosity, MAIA, or interaction effect (~.19) on chills intensity in the context of an ANCOVA. We tested for main effects of political orientation, MAIA, and religiosity (separately) on chills intensity, controlling for location, trait, and demographic variables, and examined the interaction effect of location * political orientation on chills intensity in order to test the hypothesized role of normative context.

Exploratory analysis

To explore the specificity of these relationships to chills versus changes in affect, we repeated the same ANCOVA above using change in arousal, valence, or mood, respectively, as the dependent variable(s). To examine nonparametric, directional relationships within and between traits, demographics and outcomes, we employed a mutual information analysis, as this approach can best accommodate non-normality, discrete variables, and nonlinear relationships, while also indicating directionality. As each analysis quantifies the reduction in uncertainty in a variable Y created by measuring a variable X, the output may vary when analyzing Y with regard to X. To assess the threshold for significance, we simulated a null distribution by randomizing values within each variable columnwise and repeating the pairwise analyses 5000 times. The threshold for significance at $\alpha = .05$ was set by the 95th percentile value for the bootstrapped null distribution. Thresholds varied across variables, between .013 and .029. We opted for a general threshold of .03.

TABLE 1 Replication of initial findings. Partial correlation between chills intensity, affective shift, and self-transcendence measures after controlling for stimulus, location, demographic, and trait measures.

Variable	Chills intensity	Ego dissolution	Connectedness	Moral elevation	Change in arousal	Change in valence	Change in mood	
Chills intensity	*r*	—						
Chills intensity	*p*-value	—						
Ego dissolution	*r*	**.302*** **	—					
Ego dissolution	*p*-value	<.001	—					
Connectedness	*r*	**.281*** **	**.443*** **	—				
Connectedness	*p*-value	<.001	<.001	—				
Moral elevation	*r*	**.359*** **	**.458*** **	**.516*** **	—			
Moral elevation	*p*-value	<.001	<.001	<.001	—			
Change in arousal	*r*	**.131****	.104*	−.086	−.028	—		
Change in arousal	*p*-value	.003	.040	.054	.540	—		
Change in valence	*r*	**.184*** **	.076	**.148*** **	**.152*** **	.054	—	
Change in valence	*p*-value	<.001	.090	<.001	<.001	.227	—	
Change in mood	*r*	**.153*** **	.079	**.250*** **	**.202*** **	**−.150*** **	**.292*** **	—
Change in mood	*p*-value	<.001	.079	<.001	<.001	<.001	<.001	—

Note: *=$p < .05$-$p < .01$, **=$p < .01$-$p < .001$, ***=$p < .001$.

Post hoc analysis

Certain nonlinear trends in the data caught our attention and inspired post hoc analyses; in observing the data, the overall linear trend of increased conservatism predicting chills intensity was belied by a high median chills intensity at the most liberal end of the spectrum, producing an apparent *U*-shaped relationship. We saw a similar *U*-shaped relationship between political orientation and interoceptive awareness, but no such relationship between political orientation and religiosity. We suspected that this might indicate a different underlying relationship between extremely liberal *or* extremely conservative views, interoceptive awareness, and chills, that is, that both political extremes might be characterized by a greater tendency toward physiological/visceral intensity of experience. To test this, we recoded political orientation into a variable representing the absolute deviation from the mean, and reran the mediation analysis.

RESULTS

Out of the total 882 participants, 514 (58.28%) reported experiencing chills, while 368 did not. Of the 621 California residents, 373 reported experiencing chills (60%), while 141 (53.6%) of the 261 Texas residents reported experiencing chills.

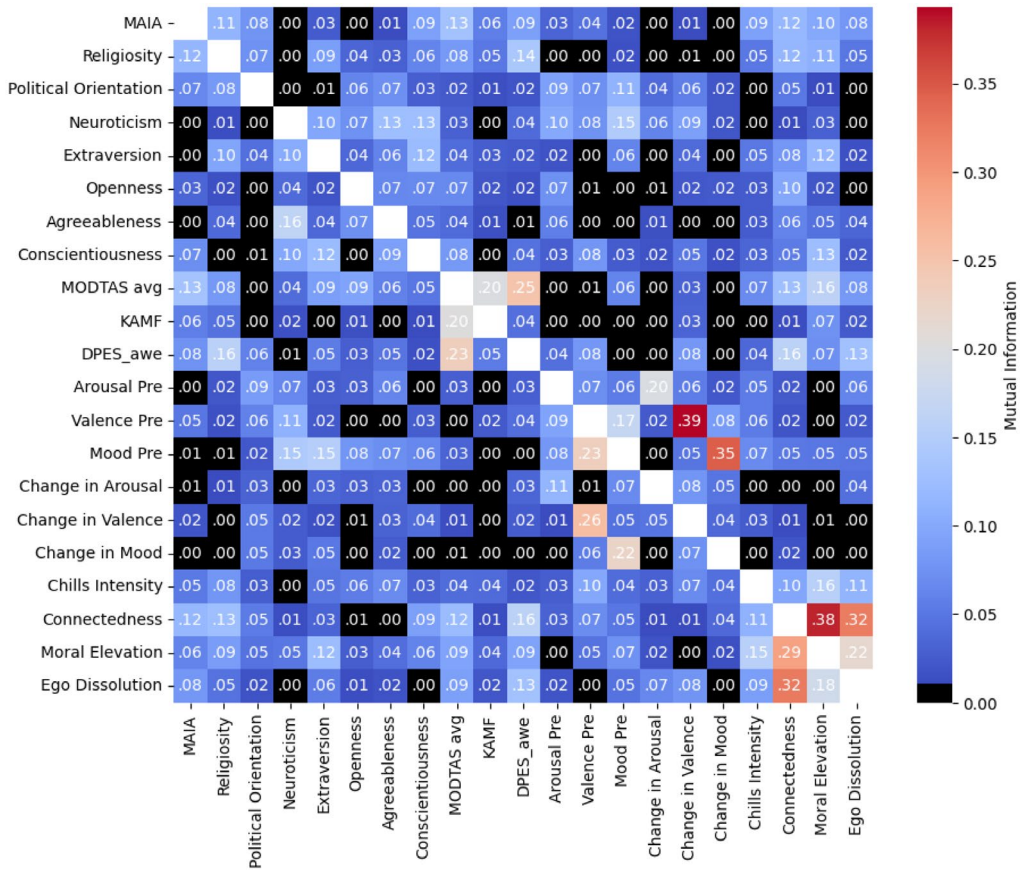

FIGURE 1 Mutual information analysis of all trait and state measures, with bootstrapped significance threshold (.03) in black. As in the original study, chills intensity and self-transcendence measures form a high mutual information cluster. Interoceptive awareness (MAIA) and religiosity do as well.

TABLE 2 Preregistered hypotheses (https://osf.io/x3wkv) alongside empirical results.

Preregistered hypotheses	Results
H1. If the observed relationship between political orientation and chills intensity is due to the relative minority status of conservatives in the original sample (California), we should see an interaction effect between chills intensity and location: the original setting (California, diverse but progressive-dominated) and a comparably diverse but conservative-dominated setting (Texas)	We while we initially observed a significant ($p = .008$) interaction between political orientation and location (Table 3) in predicting the relationship with chills intensity, this dropped below the threshold for significance when all covariates were included in the model ($p = .069$)
H2: If the observed relationship between conservatism and chills intensity is driven by conservative religiosity, then including religiosity as a covariate in the regression model should diminish or abolish the effect of political orientation	Religiosity was highly predictive in our model even after accounting for interactions with location, stimulus, and all other traits and demographic covariates (Table 3) Indeed, a mediation analysis confirmed that religiosity significantly mediates the relationship between political orientation and chills intensity (Figure 3)
H3: If political conservatism uniquely affects the reported intensity of aesthetic chills, then this relationship should be preserved when examining individuals across the political spectrum in both proposed locations and when controlling for religiosity	Political orientation remained significantly predictive of chills intensity after controlling for location, interoceptive awareness and religiosity (Table 3)
H4: Including interoceptive awareness (MAIA) in our model should diminish or abolish the effect of political orientation.	Interoceptive awareness (MAIA) was initially significantly predictive of chills intensity ($p < .001$) in the absence of other trait covariates, however, in the context of all covariates included in the final analysis, it no longer reached significance ($p = .069$), but its inclusion did not change the predictive effect of political orientation

We replicated principal findings from our prior study (Table 1, Figure 1; Christov-Moore et al., 2024) before proceeding to test our preregistered hypotheses. As in the original study, both parametric and nonparametric analyses show a strong clustering between measures of self-transcendence, affective shift, and chills intensity. In addition, the exploratory ANCOVAs with affective shift (arousal, mood, or valence) as dependent variables revealed no significant explanatory effect of any examined variable (political orientation, MAIA, religiosity), affirming that we are querying a relationship with chills intensity specifically (consistent with Christov-Moore et al., 2024; Schoeller et al., 2024) (Table 2).

Mutual information analyses (Figure 1) additionally suggest that MAIA and religiosity contribute nonoverlapping variance to the overall construct of political orientation (Figure 2).

Upon suggestion from reviewers, we also specifically examined gender differences across trait, state, and outcome measures using a nonparametric ANOVA and found significant differences in neuroticism ($p < .001$), extraversion ($p < .001$), agreeableness ($p = .001$), kama muta disposition ($p = .015$), arousal ($p = .03$) and mood ($p = .017$) prior to stimulus, ego dissolution

TABLE 3 Full ANCOVA model shows that religiosity (H2) dominantly accounts for variance in chills intensity over marginal interaction effect of location (H1), and a marginally significant effect of interoceptive awareness (H4). Political orientation remains relevant after including these variables (H3).

Variable	Sum	*df*	Mean square	*F*	*p*
Overall model	42,939.56038	41	1047.30635	4.4618	<.001
Sex	170.44867	1	170.44867	.4062	.524
Education	1426.80348	1	1426.80348	3.3998	.066
MAIA	1398.72780	1	1398.72780	3.3329	.069
Neuroticism	151.21037	1	151.21037	.3603	.549
Extraversion	2790.52509	1	2790.52509	6.6494	.010
Openness	5.06531	1	5.06531	.0121	.913
Conscientiousness	49.44720	1	49.44720	.1178	.732
Agreeableness	17.35897	1	17.35897	.0414	.839
MODTAS avg	264.29350	1	264.29350	.6298	.428
KAMF	1148.90213	1	1148.90213	2.7377	.099
DPES_awe	233.72190	1	233.72190	.5569	.456
DPES_compassion	580.67975	1	580.67975	1.3837	.240
DPES_joy	156.94476	1	156.94476	.3740	.541
DPES_love	17.54916	1	17.54916	.0418	.838
DPES_pride	.00277	1	.00277	6.61E-06	.998
DPES_amusement	4456.25413	1	4456.25413	10.6185	.001
Video	11.67826	1	11.67826	.0278	.868
Location recoded	183.88702	1	183.88702	.4382	.508
Religiosity	7544.95152	1	7544.95152	17.9784	<.001
Political orientation	8322.60894	7	1188.94413	2.8331	.007
Mood pre	3748.24833	1	3748.24833	8.9315	.003
Location recoded * Political orientation	5591.70832	7	798.81547	1.9034	.067
Video * Political orientation	4668.54300	7	666.93471	1.5892	.136
Residuals	198,082.93518	472	419.66724		

Indirect and Total Effects

Type	Effect	Estimate	SE	95% C.I. (a) Lower	95% C.I. (a) Upper	β	z	p
Indirect	Political Orientation ⇒ MAIA ⇒ Chills Intensity	0.287	0.1129	0.0653	0.508	0.0244	2.538	0.011
	Political Orientation ⇒ Religiosity ⇒ Chills Intensity	1.085	0.2202	0.6538	1.517	0.0923	4.929	<.001
Component	Political Orientation ⇒ MAIA	1.539	0.4598	0.6380	2.441	0.1461	3.348	<.001
	MAIA ⇒ Chills Intensity	0.186	0.0478	0.0925	0.280	0.1669	3.892	<.001
	Political Orientation ⇒ Religiosity	0.155	0.0202	0.1153	0.195	0.3203	7.664	<.001
	Religiosity ⇒ Chills Intensity	7.004	1.0881	4.8709	9.136	0.2882	6.436	<.001
Direct	Political Orientation ⇒ Chills Intensity	0.164	0.5074	−0.8303	1.159	0.0140	0.324	0.746
Total	Political Orientation ⇒ Chills Intensity	1.536	0.5147	0.5275	2.545	0.1307	2.985	0.003

Note. Confidence intervals computed with method: Standard (Delta method)
Note. Betas are completely standardized effect sizes

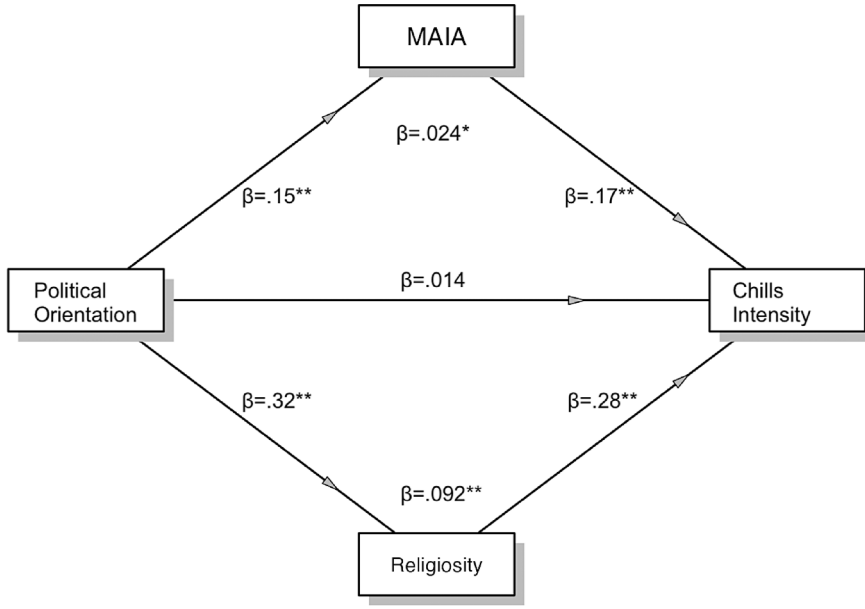

FIGURE 2 Political orientation's relationship with chills intensity is mediated by interoceptive awareness and religiosity. *$p < .05$; **$p < .001$.

($p = .022$), and connectedness to others ($p < .001$), though not in chills likelihood ($p = .805$). This further supports gender's inclusion in these and other analyses examining trait/state/outcome relationships.

Interestingly, while religiosity was a dominant explanatory variable within our initial preregistered, linear analyses, we observed nonlinear trends in the data-inspired post hoc analyses: the overall linear trend of increased conservatism predicting chills intensity was belied by a high chills intensity at the most liberal end of the spectrum, producing an apparent *U*-shaped relationship (Figure 3). We saw a similar *U*-shaped relationship between political orientation and interoceptive awareness, but no such *U*-shaped relationship between political orientation and religiosity. We suspected that this might indicate a different underlying relationship between extremely liberal *or* extremely conservative views, interoceptive awareness, and chills, that is, that both political extremes might be characterized by greater physiological/visceral intensity of experience.

As predicted, when examining the data in this fashion, interoceptive awareness was a greater mediator of political *extremism's* effect on chills intensity than religiosity (Table 4).

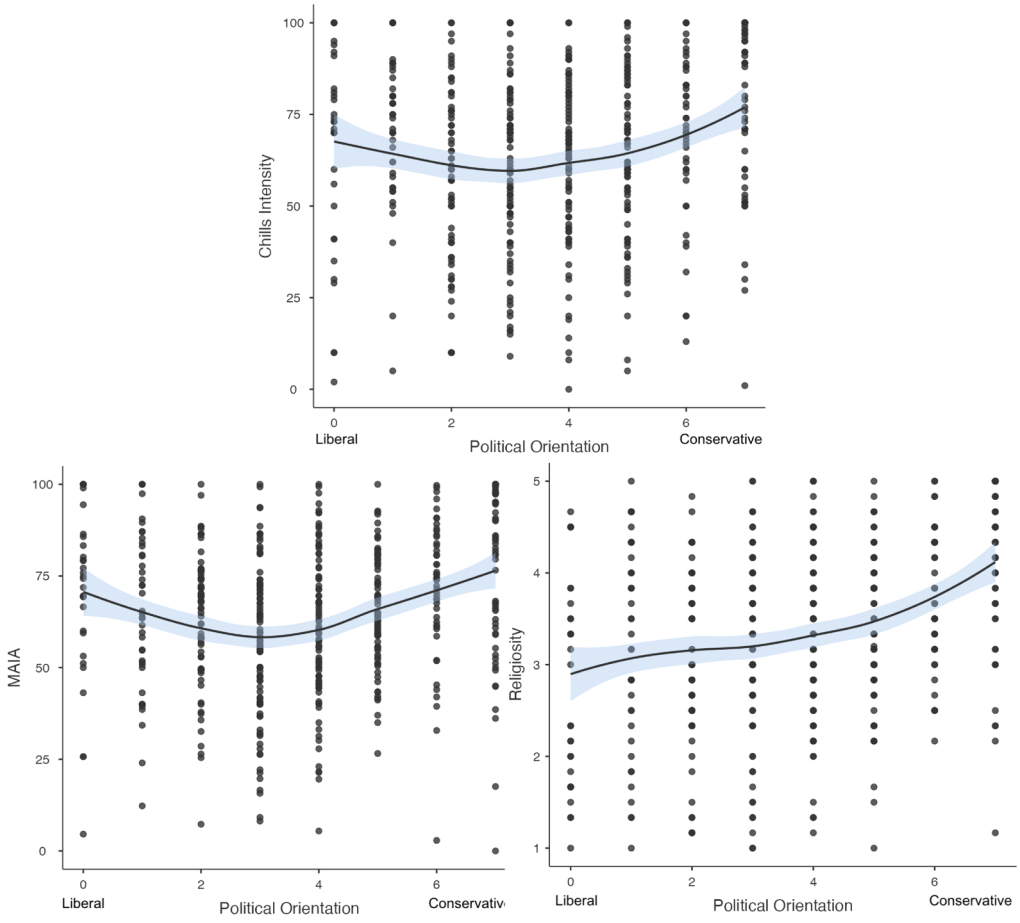

FIGURE 3 Linear and nonlinear relationships between political orientation and variables (religiosity, interoceptive awareness/MAIA) hypothesized to underlie its relationship with aesthetic chills.

TABLE 4 Post hoc analysis finds that Interoceptive awareness (MAIA), more than religiosity, mediates the relationship between the recoded variable "political extremism" and chills intensity.

				95% CI (a)				
Type	**Effect**	**Estimate**	**SE**	**Lower**	**Upper**	***β***	***z***	***p***
Indirect	Political extremism → Religiosity → Chills intensity	.5102	.2773	−.03327	1.054	.0244	1.84	.066
	Political extremism → MAIA → Chills intensity	.6713	.2403	.20022	1.142	.0321	2.79	.005
Component	Political extremism → Religiosity	.0723	.0378	−.00186	.146	.0840	1.91	.056
	Religiosity → Chills intensity	7.0581	1.0340	5.03153	9.085	.2905	6.83	<.001
	Political extremism → MAIA	4.1679	.8062	2.58783	5.748	.2223	5.17	<.001
	MAIA → Chills intensity	.1611	.0485	.06595	.256	.1443	3.32	<.001
Direct	Political extremism → Chills intensity	2.2509	.8704	.54504	3.957	.1076	2.59	.010
Total	Political extremism → Chills intensity	3.4324	.9109	1.64700	5.218	.1641	3.77	<.001

Note: Confidence intervals computed with method: Standard (Delta method). Betas are completely standardized effect sizes.

DISCUSSION AND CONCLUSION

In our attempt to elucidate the relationship between political orientation and aesthetic chills in terms of putative latent variables underlying political conservatism, we found that religiosity and interoceptive awareness were both significant contributors that lessened the explanatory power of political orientation, while we only observed an initial interaction effect of location with political orientation (later reduced below significance after controlling for trait and demographic measures) suggesting little support for hypothesis 1. Additionally, we replicated our previous finding of strong relationships between chills and measures of self-transcendence, even after controlling for prior affective state, location, stimulus, trait differences, and demographic measures (as in Christov-Moore et al., 2024).

Interestingly, while religiosity was a dominant explanatory variable within our initial preregistered, linear analyses, certain nonlinear trends in the data caught our attention and inspired post hoc analyses. A predominantly linear trend indicated that increased conservatism typically predicted stronger chills intensity, but this was belied by a visible peak in chills intensity among the most liberal participants. This deviation reveals a *U*-shaped pattern, which was also observed in the analysis of political orientation and interoceptive awareness, but not in the data linking political orientation and religiosity. We suspected that heightened physiological/visceral intensity of experience might underlie the relationship between political extremes (both liberal and conservative), interoceptive awareness, and chills. To test this, we recoded political orientation into a variable representing the absolute deviation from the mean as a proxy for extremity, and reran the mediation analysis. As predicted, when examining the data in this fashion, interoceptive awareness was a greater mediator of political *extremism's* effect on chills intensity than religiosity.

These findings demonstrate a complex relationship between political orientation and emotional processing. They question the unidirectional view of political ideology shaping emotional responses, suggesting instead that interoceptive processing may also influence political beliefs. Our replication of the original correlation between aesthetic chills intensity and political conservatism (Christov-Moore et al., 2024) across diverse geographical contexts suggests a nuanced link between political orientation and emotional sensitivity that extends beyond disgust-based responses. It does not appear to support the possibility that the political composition of a location or minority status significantly influences this relationship, though more thorough testing is necessary to say this conclusively, as the state-level sampling scope may not have been sufficient to thoroughly test the effect of political minority status within a hegemonic political environment. Religiosity in particular seems to dominate the variance underlying linear trends toward greater conservatism, suggesting that future work should test this relationship in contexts where conservatism and religiosity are less coupled, due for example to increasing secularization, as in Europe (Halman & Draulans, 2006).

The importance of religiosity and ideological extremism to chill intensity in our sample provides further evidence for the link between the religious experiences and autonomic activation. The perception of religious experiences or presences has been linked to sympathetic nervous system activation (Berntson et al., 2008; Seybold, 2007; Walter & Altorfer, 2023), and chills have been colloquially associated with peak spiritual experiences (e.g., "spiritual chills"). Notably, research in Parkinson's disease has highlighted the importance of right-hemispheric functional connectivity between semantic, reward, and interoceptive regions as being specifically important for religiosity and the ability to be moved by spiritual experiences, whereas patients with right-hemisphere onset Parkinson's have strong decreases in religiosity compared with left-hemisphere onset (Butler et al., 2010, 2011; Morgan et al., 2016). Further evidence for this biological link between these pathways and the bodily sensation of being moved by spiritual experiences has frequently been observed in cases of right-hemispheric ecstatic seizures (Devinsky & Lai, 2008; Hansen & Brodtkorb, 2003). The intensity of aesthetic chills and bodily

responses may be strongly influenced by an interplay between preexisting religiosity providing a conceptual basis for being moved, as well as heightened interoceptive awareness allowing for more global bodily experiences of affect.

The observed mediation of the relationship between chills and political orientation by religiosity echoes previous findings that indicate deeply entrenched religious beliefs can shape emotional responses more distinctly than political leanings (Finke & Adamczyk, 2008). This is a crucial addition to the understanding of how individual differences in belief systems relate to emotional processing, bodily awareness, and experience (Van Cappellen & Drummond, 2023). This may provide additional avenues by which to diagnose and possibly ameliorate political polarization via a fine-grained approach informed by psychology and neuroscience (van Baar & Feldman-Hall, 2022).

Our study brings interoceptive awareness to the forefront of this discussion. The heightened interoceptive awareness correlating with more intense aesthetic chills suggests that an individual's attunement to their internal bodily states could amplify the emotional impact of aesthetic stimuli, a notion that aligns with the research on the connection between conservatism and disgust sensitivity (Tybur et al., 2010). The complex interplay of political conservatism, religiosity, and interoceptive awareness in determining the emotional impact of aesthetic experiences underscores the multidimensional nature of emotional processing.

These findings align with research on embodied social cognition showing that social exclusion can produce measurable changes in physical temperature (Ijzerman et al., 2012). Just as social exclusion leads to decreased finger temperature and can be ameliorated through physical warmth, our finding that political extremes show heightened interoceptive awareness suggests that visceral, embodied experiences may play an important role in both the maintenance and potential moderation of extreme political beliefs. The intensity of aesthetic chills at both political extremes may reflect a broader pattern of embodied responses shaping political attitudes and behaviors.

It is important to note several important limitations. First, we neglected to examine chills related to fear responses, due in part to an emphasis on positive, aesthetic chills in our prior work, and to a dearth of validated fear-based chills stimuli generally. As fear (and its relation to safety) is a prominent emotion with an important role within political orientations and behaviors (Napier et al., 2018), this is a missing, and indeed, likely important piece of this puzzle. Our subsequent research will aim at validating fear-based chills stimuli in the same fashion as our current chills stimuli database (Chills DB, Schoeller et al., 2023a, 2023b), and testing them within the same paradigm examined here. Additionally, the stimuli used here are inherently religious and political; future work would need to be conducted to see the degree to which these relationships emerge when studying chills experiences arising from stimuli with those undertones.

In conclusion, this work highlights the mediating roles of religiosity and interoceptive awareness in the complex relationship between political orientation and the intensity of peak aesthetic experiences. These results support both a role for religiosity (which covaries linearly with increased conservatism) and interoceptive awareness (which covaries with political extremity) in mediating previously observed relationships between political orientation and peak aesthetic experience. This work additionally suggests the utility of examining aesthetic responses as a tool to identify and even alter belief structures, including those underlying political world views (e.g., Kaplan et al., 2023). Further work should attempt to replicate this outside of the American context, and employ a more comprehensive array of chills-inducing media, both including those positive and negatively valenced, as well as those more directly targeted to distinct political orientations. This can broaden the understanding of how political orientation interplays with emotional, interoceptive, and aesthetic experiences, and furthermore allow for an integrative framing of these constructs within a general embodied account of belief.

ACKNOWLEDGEMENTS

This work was supported by awards from YSF Innovation Fund and Tiny Blue Dot foundation to NR and LCM, and awards from Joy Ventures, BeSound SAS, Nested Minds LTD, European Commission, and the French Ministry of Armed Forces to FS.

FUNDING INFORMATION

LCM, FS, and NR are funded by grants from the Tiny Blue Dot Foundation and the YSF Innovation Fund. Additionally, FS is partially funded by a Joy Ventures research grant. FS is the co-founder of BeSound SAS and Nested Minds LTD, holds ownership shares, and has received compensation from both companies. In the past years, FS work has been funded by the European Commission and the French Ministry of Armed Forces (AID).

DATA AVAILABILITY STATEMENT

The preregistration, associated documentation (analysis plan), and full dataset can be found at https://osf.io/x3wkv. The link to the full ChillsDB 2.0 database from which stimuli were drawn, can be found at https://osf.io/p34zy/.

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How to cite this article: Christov-Moore, L., Schoeller, F., Vaccaro, A. G., Pluimer, B., Iacoboni, M., Kaplan, J., & Reggente, N. (2025). Individual differences in aesthetic experience point to the role of bodily awareness in political orientation. *Political Psychology*, *00*, 1–18. https://doi.org/10.1111/pops.70051