The psychology of justice buildings: A survey experiment on police architecture, public sentiment, and race

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ABSTRACT

Empirical investigations examining how the architectural design of justice buildings impacts the public is scant and heavily skewed toward the design of penal institutions. Applying theories of hostile and welcoming building design, this study uses a survey experiment to investigate the impact that welcoming and hostile police station designs have on public affect and behaviorally relevant perceptions. Findings reveal main and interactive effects of architectural design on positive affect. Specifically, building design becomes a significant predictor of perceptions depending on an individual's self-identified racial or ethnic group, where Black and Latino respondents report greater positive emotional responses when presented with hostile as compared to welcoming building designs. However, there was no impact of building design on negative affect or behaviorally relevant perceptions to report crime. The results of this study have potential implications for impacting public perceptions about policing and improving service delivery experiences.

The events of 2020 – from the killings of Breonna Taylor and George Floyd to clashes between civilians and police in subsequent protests – have given renewed attention to the dynamics between law enforcement and the communities they police, particularly street encounters. Police scholarship has revealed that the tenor of broader police-community relationships originates in individual civilian-to-officer encounters, the cumulative effect of which subsequently shape individual and global attitudes toward the police (Mazerolle et al., 2013). Direct and vicarious experiences of unjust and unfair treatment leave lasting impressions on the recipients, dissuading them from cooperating with police agents, complying with police and legal dictates, or relying on police agencies for protection or conflict resolution (Gau, 2015; Gau and Brunson, 2015). Disproportionately, opportunities to repair this damage through more positive interactions arise in the same context in which poor encounters do, on the street. Unfortunately, there it is difficult for officers to predict or control the environments where they meet members of the public.

However, a significant number of civilian-police encounters occur off the streets and in places that police administrations do control: police stations. At the station, suspects are brought for booking, victims come to report crimes, people file complaints and retrieve records, and officers conduct important parts of their work. In fact, many members of the public interact with police *buildings* more than with police *officers*; one may walk, jog or drive past a station repeatedly without ever meeting an officer. This is important, for semiotics research demonstrates that built structures communicate messages from and about the people who built and occupy them (Munro, 1987; Whyte, 2006) and, in the case of police, offer one of the surest opportunities to do so.

Understanding this, police agencies across the country have concluded that their buildings do not reflect their values and have endeavored to change perceptions, in part, by changing the places associated with them. From small towns, like New Canaan (Connecticut), to large cities, including Cincinnati (Ohio), Nashville (Tennessee), Seattle (Washington) and New York (New York), police departments across the United States have sought to make their buildings appear more welcoming (Alund, 2016; Bailey, 2018; Bentley, 2015; Kinney, 2016; Marsh, 2015; Stevens, 2016). Yet, there is little research that empirically examines the impact of police station buildings on the public. The present study aims to address this by exploring how building design influences civilians' (i) affective orientations toward police, (ii) willingness to report crime, and (iii) differences in these across racial and ethnic groups. We begin with a review of research on police building architecture; an introduction to a welcoming and hostile building typology; a note on systemic racism and perceptions of hostility; and transition into the current study.

1. Literature on police architecture

That buildings influence human psychology and behavior has been demonstrated across disciplines, such as architecture and urban design

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(e.g., Nasar, 1994), and in interdisciplinary subfields like psychogeography (e.g., Smith, 2010) and visual sociology (e.g., Harper, 2012). Nasar (1994) highlights that the design of a building can illicit affective responses (e.g., excitement or relaxation), a conclusion reflected in the earliest writings on criminal justice architecture (Bentham, 1791) and which maintains centrality in contemporary works (Moran et al., 2016).

Notably, most research in justice architecture is concentrated on the design of penal institutions, such as jails, prisons and detention centers. In this vein, researchers have investigated how correctional architecture impacts important outcomes such as inmate-on-inmate violence (Morris and Worrall, 2014) or staff-inmate relationships (Beijersbergen et al., 2016), and have proposed frameworks for designing more humane facilities (Jewkes, 2018; St. John et al., 2019). To date, there are few published studies on the architecture of police buildings and the way these places influence individual perceptions and behaviors. In fact, we found only three.

Clinton and Devlin (2011) had college students rate images of police stations on perceived authority, professionalism, and approachability. Their study found that most individual personality and demographic traits did not influence ratings significantly, except for gender, where women gave higher ratings across all dimensions. In open-ended questions, respondents preferred a building that showed "authority, is professional, and is approachable…proportionally sized to the community, well-kept, and clean…windows in the façade…'well-lit,' 'open,' 'bright,' and 'clear'" (Clinton and Devlin, 2011, p. 405). Though the study shed light on how respondents applied researchers' classifications, it did not examine a link between architectural judgments and larger social psychological constructs (e.g., general satisfaction with police, legitimacy) or behaviorally relevant perceptions (e.g., compliance or cooperation with police). Exploring police architecture in the United Kingdom, Millie's (2012) interviews, predominantly with police personnel, produced a typology of police architecture: police stations as (i) intimidating fortresses, (ii) secret places, and (iii) public buildings where the public is welcomed. More recently, Toews (2018) conducted qualitative interviews and focus groups with a small sample of crime victims and social service staff about their experience of courthouses and, to a lesser extent, police stations. Toews found these buildings interpreted as cold, distant, without privacy, reflective of victims' insignificance and reminiscent of their original victimization.

Together, these studies only begin to uncover the influence of police architecture on perceptions of law enforcement. Despite paving the way, all three studies used small homogenous samples: Clinton and Devlin (2011) used a convenience sample of 122 students; Millie's (2012) study was based on a snowball sample of 15 police personnel and 1 design representative; and Toews (2018) interviewed a convenience sample of 6 victims of violence and 12 victim service organization personnel. Of these, only one conducted quantitative analyses (see Clinton and Devlin, 2011). Extending these foundational studies, our present study examines the impact of the physical exterior of police buildings on public perceptions of police and subsequent behaviorally relevant perceptions to report crime. Further, we explore the way in which different racial and ethnic groups, particularly those overrepresented in contact with the justice system, are influenced by police architecture.

2. Building typology: welcoming and hostile designs

In the present study, we test the perceptual and behavioral influence of "welcoming" versus "hostile" police architecture. A nascent, but growing, body of work in justice architecture asserts that open, transparent and inclusive places encourage positive feelings (e.g., Pati et al., 2007, 2010). Writing for *The Police Chief* magazine, Blount-Hill and St. John (2017) proposed a design framework to enhance what they called architectural "welcomingness." Blount-Hill et al. (2017) suggested that open, transparent and inclusive (OTI) design features would impact general perceptions, such as legitimacy (see also St. John, 2020; St. John and Blount-Hill, 2018; St John and Blount-Hill, 2019).

Summarizing Blount-Hill et al. (2017), we define welcomingness as

the quality of a building's architectural and aesthetic design, maintenance, and locational settings that invite users to enter and remain there comfortably. In discerning what observable building features constitute welcoming architecture, prior work suggests visible, clear windows and conspicuous entryways (Pati et al., 2010). Millie (2012) emphasized that police buildings need to be clearly identified (so that you know what it is) but also reminiscent of less intimidating places (e.g., a bank). Beyond these clues, precise delineation of what a welcome design entails have not been further explicated.

Contrastingly, Petty (2016) describes hostile architecture as "defensive" or "disciplinary," a term that "loosely describes various structures that are attached to or installed in spaces of public use in order to render them unusable in certain ways or by certain groups" (p. 68). Hostile buildings make clear visitors are not welcome. Certain design features can illicit feelings of intimidation or unapproachability (Clinton and Devlin, 2011; Millie, 2012), such as barriers, walls, spiked fences, and other components separating the public from the building (Petty, 2016). Nonetheless, as with welcoming architecture, no definitive and comprehensive list of features comprising hostile architecture exists.

We designed the subsequent survey experiment using the aforementioned theoretical work. We expect that "welcoming" and "hostile" architectural designs will impact perceptions of police stations as well as behaviorally relevant perceptions. As part of our analysis we had survey respondents rate several buildings on qualities conceptualized as welcoming or hostile to operationalize these concepts (as discussed in more detail below). However, we acknowledge that an assessment of welcomingness or hostility is subjective and perceptual, heavily influenced by the idiosyncrasies of the individual and by the people or things one encounters. Further, justice architecture may have differential impacts across racial and ethnic groups given the racialized nature of historical and present-day criminal justice experience. Next, we consider these implications for our hypotheses.

3. Systemic racism and perceptions of hostility

Discussions of a welcoming or hostile police station typology would be incomplete without an acknowledgement of the racial and ethnic dynamics at play in policing. Studies on public perceptions of police demonstrate that the racial category with which one identifies significantly predicts their affinity for law enforcement (Schuck et al., 2008), which has downstream effects on willingness to cooperate with the police and likelihood of reporting crime (Kwak et al., 2019). It is therefore not hard to imagine that perceptions of police buildings are also racialized. To some, architecture conveying grandeur, security, cold efficiency, or apparent transparency may merely showcase the power and duplicity of police threat.

Unnever and Gabbidon (2011) find the psychological toll of discrimination to be of central importance in understanding Black orientations toward the law, law enforcement, and societal institutions in general. In their conceptualization of Black culture, Blount-Hill and St. John (2017) posit that cynicism toward status quo state institutions, including law enforcement, is a defining and distinguishing feature (see also MacDonald et al., 2007). Cynicism holds no matter socioeconomic status (Gaston and Doherty, 2018; but cf. Jones and Greene, 2016), but, for those in lower socioeconomic strata, life in largely segregated neighborhoods, both over- and under-policed, ensures frequent unwelcomed encounters initiated by officers and characterized by procedural injustice, disrespectful treatment, and, often, illegal uses of force (Brunson and Weitzer, 2009; Headley and Wright, 2020; Weitzer, 1999; Weitzer et al., 2008). Quantitative studies have demonstrated the connection between mistreatment and mistrust (Schuck and Rosenbaum, 2005), but the rawness of Black sentiments toward police may best be captured in presentations of their own words as highlighted in qualitative studies (see (Blount-Hill, n.d.); Brunson and Wade, 2019; Brunson and Miller, 2006; Cobbina, 2019; Wright and Headley, 2020).

Latino[1] perceptions of police typically reside in a middle ground between the dominant culture's lionization of officers and the deep cynicism of Black populations (Schuck and Rosenbaum, 2005; Weitzer and Tuch, 2005). Unfortunately, despite the growing size and relevance of this ethnic group, woefully little research has been conducted on their perceptions of law enforcement. A growing literature, however, demonstrates that Latino individuals – particularly young males in poorer neighborhoods – have a dim view of law enforcement (Rios, 2011; Solis et al., 2009; Vidales et al., 2009) and at times may respond to perceived injustice even more negatively than Black populations (Hagan et al., 2005). While research demonstrates that certain groups of Latino individuals in the United States (such as those without proper legal documentation) are less likely to engage with police (Skogan, 2009a), these individuals often still hold less favorable perceptions of police (Roles et al., 2016).

We know of no conceptual framework aiming to predict or explain differential perceptions of justice architecture across racial and ethnic category. Nonetheless, research on perceptions of police more broadly offers clues to likely racial patterns in the affect evoked by police buildings (for review, see (Blount-Hill, 2020). Weitzer and Tuch (2004) note "African Americans and Hispanics … should be more inclined to view the police as a 'visible sign of majority domination' … as contributing to their subordination through both legal and extralegal practices, as frequently involved in mistreatment of minority citizens, and as feeling that their group interests would be advanced by greater controls on police" (p. 306). As such, we would expect that perceptions of police architecture are moderated by racial and ethnic identification, given the notable differences in perceptions of police generally.

4. The current study

4.1. Research questions and hypotheses

Given the scant availability of research on police architecture and its impact on perceptions and behaviors, we address this absence and explore the following research questions: how does the design of a police building influence (i) civilians' affective orientations toward police, (ii) their behaviorally relevant perceptions, and (iii) differences in these across racial and ethnic groups. Put succinctly, we hypothesize (H) that: (H1) "welcoming" police station designs will lead to greater positive affect (e.g., evoke feelings of calmness); (H2) "hostile" police station designs will lead to greater negative affect (e.g., evoke feelings of nervousness); (H3) "welcoming" compared to "hostile" police station designs will yield more positive or cooperative behaviorally relevant perceptions (e.g., perceptions that influence crime reporting); and (H4) when compared to White respondents, Black and Latino respondents will be more influenced by hostile architecture leading to decreased positive affect, increased negative affect and less positive or cooperative behaviorally relevant perceptions.

4.2. Research design

In the present study, we employed a vignette survey experiment with a between-subjects design to isolate the impact of police buildings on affect and behaviorally relevant perceptions, testing our hypothesized social-physical environment interactions. Survey experimentation has gained popularity in a variety of fields and allows for robust causal inferences about the affective and cognitive sentiments or perceptions of respondents (Merola et al., 2019; Sniderman, 2011). Our design features manipulated one factor ("type of building") where half of the participants were randomly assigned to view an image of one of three hostile buildings and the other half were assigned to view one of three welcoming buildings (see Fig. 1). Scholars have previously noted that multiple stimuli representing

an experimental condition increases stimuli generalizability, particularly important in vignette studies (see Highhouse, 2009).

4.3. Operationalizing welcoming and hostile buildings

The images we selected to represent welcoming police stations had visible entryways, green and orderly surroundings, plentiful transparent windows, whereas buildings kept behind large walls or barriers and lacking transparent windows served as hostile designs. In a pilot study using an online sample derived from Amazon MTurk, we asked 249 respondents to rate various police buildings based on characteristics indicative of architectural welcomingness or hostility – after conducting attention checks we used a total of 239 respondents for our pilot study analysis. We had respondents rate buildings on various dimensions so that we could select images that scored higher or lower on certain dimensions. To get at conceptual notions of a building's welcomingness, we asked respondents about dimensions that aligned with Blount-Hill et al.'s (2017) OTI design: (i) *openness* was captured by respondent perceptions of "open to the public," "welcoming to the public," and "liberating;" (ii) *transparent* was measured by perceptions of "easily accessible" and "harmless;" and (iii) *inclusive* was captured by perceptions of "hospitable," "friendly," "social," and "safe." To get at conceptualizations of a building's hostileness, we drew three characteristics from Petty's (2016) work to ask respondents about: (i) direct perceptions of *hostility*; (ii) *division* as measured by perceptions of "isolation," "coldness," and "secretive;" and (iii) *opposition* operationalized by perceptions of "threat", being "unsafe", and "oppression."

For each image, we used exploratory factor analysis (EFA) with orthogonal varimax rotation to create composite ratings (Kaiser, 1958). Due to the ordinal nature of these measures, we used the polychoric correlation matrix rather than the Pearson correlation matrix (Olsson, 1979). In each case, an EFA including all 16 items meant to measure whether police building design was welcoming or hostile loaded primarily onto one dimension (and each measure included to understand hostility exhibited a reversed score). Across images and scales, the eigenvalues of the primary factors ranged from 8.93 to 10.53, accounting for 60% to 82% of the variance in the data. Further, Kaiser-Meyer-Olkin measures of sampling adequacy demonstrated the high suitability of our data for factor analyses (Kaiser, 1970). Therefore, we combined the rating scores into one scale, each with a Cronbach's alphas of 0.93 or higher, indicating strong and reliable interitem correlation within the respective scales (Cronbach, 1951). Average factor scores were compared across images, where lower numbers indicated a building was perceived as more welcoming (or less hostile) and higher numbers indicated a building was perceived as more hostile (or less welcoming). Respondents rated images we conceptually classified as hostile (as compared to welcoming) higher on this composite measure, indicating alignment. Based on the ratings from our pilot study, we selected displays of three different images in each experimental condition (the three images that were rated most welcoming and the three that were rated most hostile).

For the current experimental study, participants were first presented a brief vignette of a crime with the option to report the criminal activity in person at the local police department. This vignette was accompanied by a picture displaying one external façade: either a welcoming or hostile police station. Participants were randomly assigned to each condition and, after reading the vignette and seeing the associated images, they were asked to report their affective state and behaviorally relevant perceptions. A full description of our experimental study, with pictures, can be found in Appendix A. Our affective questions asked respondents to indicate the likelihood they would feel safe, confident, jittery, optimistic, nervous, calm, worried, content, or relaxed in approaching the building (adapted from Bennefield, 2018; Marteau and Bekker, 1992). Each of the affective responses were measured on a five-point scale, which ranged from "clearly describes my feelings" to "does not describe my feelings." Behaviorally relevant perception questions asked participants to report (i) their level of confidence in their criminal

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[1] We use this term to describe a person in the United States with ties to Latin America. We do not use it as indicative of gender pronouns, rather we intend to be inclusive of men and women.
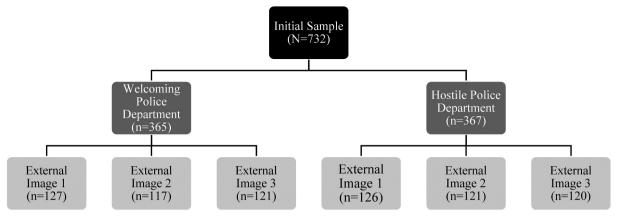
Fig. 1. Sampling Design.

complaint being taken seriously, (ii) their perceived level of professionalism that individuals in the building possess, and (iii) their likelihood of entering into the police building (adapted from Clinton and Devlin, 2011). These were measured on a five-point Likert scale, where *Taken Seriously* and *Professional* ranged from "strongly agree" to "strongly disagree" and *Enter In* ranged from "very likely" to "very unlikely." Within both sets of questions (affective responses and behaviorally relevant perceptions) the statements were presented in a randomized order to reduce the influence of any one particular order.

Participants were also asked to provide information on a series of demographic, attitudinal and experiential items that might otherwise explain variation in our study outcomes or moderate observed relationships. Demographic items included race and ethnicity, age, gender, political party identification, political ideology, religious affiliation and attendance, educational attainment, marital status, employment and income, and region of the United States. We measured key constituent elements of police legitimacy, including felt obligation to obey (adapted from Huq et al., 2017; Jackson et al., 2014; Tyler, 2005; Tyler et al., 2014; Wolfe et al., 2016) and normative alignment (adapted from Bradford and Jackson, 2018; Huq et al., 2017; Jackson et al., 2014; Wolfe et al., 2016), as well as more general satisfaction with and confidence in the police. For each item, respondents were asked their level of agreement based on a five-point Likert scale, which ranged from "strongly agree" to "strongly disagree." For these attitudinal items, we employed balanced randomization wherein half of the respondents completed these measures before receiving the experimental manipulation and the other half did so after. Also, the ordering of these specific statements was also randomized to ensure that one particular order did not influence the results. Lastly, we included three experiential items capturing (i) prior contact with the police, (ii) arrest history and (ii) whether the respondent had been inside a police department before (adapted from Swaner et al., 2018).

4.4. Current sample

Our survey experiment was funded by Time-Sharing Experiments for the Social Sciences (TESS), a National Science Foundation-funded program assisting researchers in collecting original survey experimental data and providing technical assistance from the University of Chicago's NORC, a survey research firm. The survey was fielded in November 2019 using NORC's AmeriSpeak® panel, a probability-based nationally representative survey platform. The survey was offered only in English and was self-administered online to a general population sample of adults aged 18 and older. Participants were offered the cash equivalent of $3 for completing the study. Our survey completion rate was 23.4%.

While our initial sample consisted of 732 respondents (see Fig. 1), due to some missing responses, our final models contain a sample of 700 respondents with an approximate proportionate demographic

sample of White ($n = 237$), Black ($n = 238$) and Latino ($n = 225$) representation. Oversampling Black and Latino respondents provided for a randomized block design, which was important to mitigate within-group homogeneity and limited variability that is more likely to occur in studies using smaller racial or ethnic subsamples. Descriptive statistics for the entire sample can be found in Table 1.

4.5. Analytical strategy

To assess the impact of building design on affective outcomes and behaviorally relevant perceptions, we ran three separate models with distinct dependent variables. The first two dependent variables were positive and negative affect respectively. We examined the underlying structure of our nine affective responses using exploratory factor analysis ($\alpha = 0.88$). Due to the ordinal nature of these measures, we used the polychoric correlation matrix rather than the Pearson correlation matrix (Olsson, 1979). Applying the Kaiser criterion, we retained only factors with eigenvalues above 1 (Kaiser, 1960). EFA produced two factors, which we name positive and negative affect ($\lambda = 3.86$ and 2.45, respectively). Table 2 includes rotated factor loadings, uniqueness, eigenvalues, and the percent of item variance explained for each factor.

The items' relatively low uniqueness values and high communalities (calculated by subtracting uniqueness values from 1) for the full sample suggested that these items were reliable indicators of the two factors. Factor 1 accounted for 62.01% and factor 2 accounted for 39.41% of the variance in the original items for the full sample. Table 2 displays that the affective states that loaded highly unto the first factor were safe, confident, optimistic, calm, content, and relaxed (i.e., *positive affect*), whereas the affects that loaded highly on the second factor were jittery, nervous, and worried (i.e., *negative affect*).[2]

The final dependent variable of interest, *behaviorally relevant perceptions*, was also created using EFA. We combined three variables asking respondents to report their (i) level of confidence in their criminal complaint being taken seriously, (ii) perceptions of the level of professionalism that individuals in the building possess, and (iii) likelihood of entering into the police building to report the crime. Using the polychoric correlation matrix, the underlying structure of these three responses ($\alpha = 0.82$) revealed one factor ($\lambda = 2.03$) where each variable loaded onto substantially. We view this factor as respondents' perceptions that are behaviorally relevant as opposed to the prior emotional measures. Table 3 includes rotated factor loadings,

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[2] We use the terms positive and negative affect loosely to describe the individual items that loaded onto each factor. In doing so, we acknowledge that these are neither complete opposites nor functional equivalents and should not be treated as such (i.e., positive affect is not the absence or replacement of negative affect and vice versa). Rather, both positive and negative affect (as measured herein) may coexist.

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Table 1
Sample demographics.

	N	M (SD) or %	Min-Max
Race or Ethnicity	700		
White	237	33.86	0–1
Black	238	34.00	0–1
Latino	225	32.14	0–1
Age	700	44.33 (15.97)	19–86
Gender	700		
Male	341	48.71	0–1
Female	359	51.29	0–1
Political Party Identification	695		
Leans Democrat	405	58.27	0–1
Leans Republican	170	24.46	0–1
Don't Lean or Independent	120	17.27	0–1
Political Ideology	616		
Liberal	302	49.03	0–1
Moderate	171	27.76	0–1
Conservative	143	23.21	0–1
Religious Attendance	693		
Less than once per month	431	62.19	0–1
Once per month or more	262	37.81	0–1
Educational Attainment	700		
Less than high school	36	5.14	0–1
High school	355	50.71	0–1
College or more	309	44.14	0–1
Marital Status	700	2.98	
Married or Cohabitating	307	43.86	0–1
Not Married or Cohabitating	393	56.14	0–1
Employment	700		
Not Working	233	33.29	0–1
Working	467	66.71	0–1
Income	700		
Less than $50,000	347	49.57	0–1
At least $50,000	353	50.43	0–1
Region	700		
Northeast	100	14.29	0–1
Midwest	145	20.71	0–1
South	263	37.57	0–1
West	192	27.43	0–1
Arrested	693		
Yes	187	26.98	0–1
No	506	73.02	0–1
Inside Police Dept	698		
Yes	573	82.09	0–1
No	125	17.91	0–1
Dissatisfied with Last Police Encounter	699		
Yes	134	19.17	0–1
No or Not Applicable	565	80.83	0–1

Table 2
Summary of Factor Analysis Using Principal Factors Method and Varimax Rotation.

	Factor 1: positive affect	Factor 2: negative affect	Uniqueness
Safe	**0.79**	−0.16	0.36
Confident	**0.85**	−0.25	0.22
Jittery	−0.18	**0.84**	0.27
Optimistic	**0.67**	0.06	0.54
Nervous	−0.24	**0.85**	0.23
Calm	**0.79**	−0.41	0.21
Worried	−0.28	**0.75**	0.35
Content	**0.81**	−0.23	0.29
Relaxed	**0.79**	−0.40	0.22
Eigenvalue	3.86	2.46	
Percent of variance	62.01	39.41	

Note: Factor analysis done using polychoric correlation matrix. Factor loadings greater than 0.5 appear in bold.

uniqueness, eigenvalues, and percent of variance for behaviorally relevant perceptions.

While the main predictor variable of interest was the police building condition (hostile vs. welcoming), we were also interested in how its effects

Table 3
Summary of Factor Analysis Using Principal Factors Method and Varimax Rotation.

	Factor 1: behaviorally relevant perceptions to report crime	Uniqueness
Taken seriously	**0.86**	0.26
Professional	**0.86**	0.27
Enter In	**0.75**	0.45
Eigenvalue	2.03	
Percent of variance	111.74	

Note: Factor analysis done using polychoric correlation matrix. Factor loadings greater than 0.5 appear in bold.

differ across race and ethnicity; we therefore included interaction terms between condition and racial or ethnic group, using White respondents in the hostile condition as the reference category. We report the sample average treatment effect to compare across groups rather than generalize to a boarder population (Franco et al., 2017). Because respondents were randomly assigned to vignette conditions, sociodemographic differences should not bias the results (Mutz, 2011). To ensure this, we ran chi-square tests of independence for the entire sample between the experimental conditions and key sociodemographic, political, and experiential characteristics including race and ethnicity (X^2 (2, $N = 732$) = 1.27, $p = 0.53$), sex (X^2 (1, $N = 732$) = 0.44, $p = 0.51$), education (X^2 (3, $N = 732$) = 1.70, $p = 0.64$), region (X^2 (3, $N = 732$) = 1.54, $p = 0.67$), marital status (X^2 (1, $N = 732$) = 0.00, $p = 0.95$), income (X^2 (1, $N = 732$) = 0.14, $p = 0.71$), employment status (X^2 (1, $N = 732$) = 1.81, $p = 0.18$), church attendance (X^2 (1, $N = 725$) = 0.60, $p = 0.44$), political ideology (X^2 (2, $N = 645$) = 0.01, $p = 1.00$), political party identification (X^2 (2, $N = 727$) = 6.00, $p = 0.05$), prior arrest (X^2 (1, $N = 724$) = 0.39, $p = 0.53$), last police encounter (X^2 (1, $N = 730$) = 0.09, $p = 0.76$), and prior experience inside a police department (X^2 (1, $N = 730$) = 0.00, $p = 0.95$). We also ran independent samples t-tests for age across the welcoming ($M = 44.99$, $SD = 0.86$) and hostile ($M = 44.63$, $SD = 0.84$) condition, $t(730) = 0.29$, $p = 0.77$). We were unable to reject the null hypothesis of independence in all of these analyses except one, party identification. This suggested that random assignment produced no significant differences between the hostile and welcoming conditions, apart from the differences in political party identification.

5. Study results

We first assessed descriptive statistics from the experimental manipulations by graphing the experimental results and plotting the means across conditions and race/ethnicity with standard error bars. Fig. 2 shows that, on average, White respondents in the welcoming condition were more likely to agree with positive affect sentiments compared to those in the hostile condition. On the contrary, Black and Latino respondents were less likely to agree with positive affect sentiments in the welcoming condition compared to those in the hostile condition. Statistical significance aside, these latter results were unexpected. Fig. 3 indicates that, on average, White respondents were slightly more likely to agree with negative affect statements in the welcoming condition compared to the hostile condition. Yet, both Black and Latino respondents were significantly less likely to agree with negative affect statements in the welcoming condition compared to the hostile condition. Finally, Fig. 4 displays behaviorally relevant perceptions. Regardless of the experimental condition, White respondents were similar in their behaviorally relevant perceptions as indicated by their perceptions of police professionalism, perceptions of their criminal complaint being taken seriously, and their likelihood of entering the police station. However, Black respondents in the welcoming condition, as compared to the hostile condition, were more likely to agree with statements regarding professionalism, being taken seriously, and their likelihood of entering the building. Latino exhibited the opposite
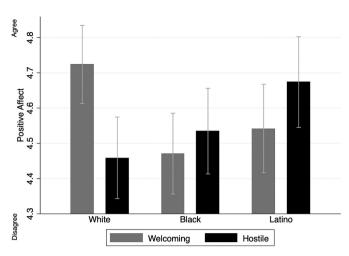
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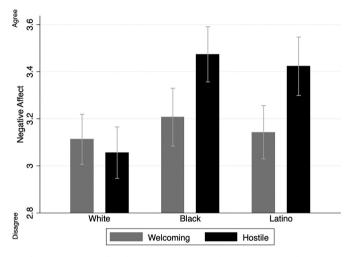Fig. 2. Positive Affect by Experimental Condition and Race/Ethnicity.

Fig. 3. Negative Affect by Experimental Condition and Race/Ethnicity.

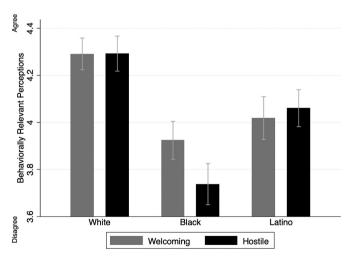Fig. 4. Behaviorally Relevant Perceptions by Experimental Condition and Race/Ethnicity.

Table 4
Ordinary Least Squares Regression.

Variables	(1)	(2)	(3)
	Positive Affect	Negative Affect	Behaviorally Relevant Perceptions
Hostile (vs. Welcoming)	−0.27	−0.067	0.03
	(0.15)*	(0.17)	(0.11)
Black (vs. White)	−0.25	0.09	−0.35
	(0.16)	(0.16)	(0.12)***
Latino (vs. White)	−0.18	0.03	−0.23
	(0.100)*	(0.15)	(0.11)**
Hostile x Black	0.34	0.33	−0.22
	(0.18)*	(0.22)	(0.18)
Hostile x Latino	0.40	0.35	−0.02
	(0.22)*	(0.28)	(0.13)
Constant	4.72	3.11	4.27
	(0.08)***	(0.12)***	(0.08)***
Observations	700	700	700
R-squared	0.01	0.02	0.05
State Clusters	46	46	46

Robust standard errors in parentheses.
*** $p < 0.01$.
** $p < 0.05$.
* $p < 0.1$.

Next, we ran ordinary linear squares regressions to explain the impact of condition and race/ethnicity on each of the outcomes of interest. Table 4 includes results from the regression of affect and behaviorally relevant perceptions on building design by race and ethnicity. In Table 4, we regress positive affect (Model 1), negative affect (Model 2) and behaviorally relevant perceptions of crime reporting (Model 3) on whether the respondent viewed a hostile (as opposed to welcoming) image of a police department, the race or ethnicity of the respondent, and an interaction between condition and race/ethnicity. Each model included robust standard errors to account for nonnormal residuals, heteroskedasticity and state-level clusters to relax the assumption of independence across observations. In Appendix C, we include separate regression models to see the effects on individual items rather than composite scores (see Tables A1 and A2 for affect and behaviorally relevant perceptions, respectively).[3]

Model 1 is the only model to demonstrate statistical significance for a main and interactive effect. Specifically, in Model 1, when examining positive affect, the main effect of a hostile (versus welcoming) building is negative and statistically significant. This indicates that when presented with a hostile building (i.e., one that appears to be more isolated, cold, secretive, threatening, unsafe and oppressive), respondents were less likely to agree with positive affective statements (inclusive of feeling safe, confident, optimistic, calm, content, and relaxed) compared to when presented with a welcoming building. However, interactions between the hostile image and a Black and Latino respondent are both positive and statistically significant. This indicates a reversed trend from the prior finding in that Black and Latino respondents in the hostile condition are more likely to agree with positive affective statements compared to White respondents in the hostile condition. In Models 2 and 3, there are no statistically significant main or interactive effects of building type with race and ethnicity. Even so, this analysis provides evidence that the effects of the hostile image on positive affect differs by the racial or ethnic identity of the respondent; however, not

trend, with respondents in the welcoming condition being slightly less likely to agree as compared to the hostile condition. For descriptive statistics of respondents broken down by the individual items in each of the three composite measures across race and ethnicity, see Tables A1 and A2 in the Appendix B.

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[3] While the separate regression models are not the main focus of this paper, it is important to note that there is no main effect of hostile vs. welcoming building design on any individual item. In Appendix C, the regression models show that only the following interactions yield positive and statistically significant findings: hostile by Latino on feeling optimistic, content, and jittery; and hostile by Black on feeling jittery. We also estimated ordered logit models across individual items as a form of robustness check, however, the substantive conclusions remain the same.

in the expected directions. We now turn to the literature to make sense of these unexpected findings.

6. Discussion

In this study, we isolated the influence of police building design on the general public's affect toward police and their behaviorally relevant perceptions to report crime, while paying close attention to racial and ethnic nuances. Our endeavor was inspired by renewed attention to the presentation of public spaces in urban planning and criminal justice policymaking, and by emerging theoretical propositions arguing for its significance. Our analyses did produce evidence of a direct, unmediated influence by police building façade on positive affective orientations toward police but not on negative affect or on behaviorally relevant perceptions. The findings also revealed racial and ethnic differences in the positive emotional responses elicited by police architecture, though not for negative affect or behaviorally relevant perceptions. That said, the results demonstrated mixed support for our hypotheses regarding main and interactive effects.

First, we hypothesized a main effect of building type (i.e., welcoming or hostile) on affect, where welcoming buildings evoked positive affect (H1) and hostile buildings negative affect (H2), and on behaviorally relevant perceptions, where welcoming buildings as opposed to hostile buildings led to more positive or cooperative behaviorally relevant perceptions (H3). The results of our analyses only displayed a direct effect of building type on positive affect. Specifically, hostile building designs led to decreased positive affect as compared to welcoming building designs. This main effect offers support for our hypothesis that building design does impact affect in the expected directions. In making sense of the null finding for negative affect and behaviorally relevant perceptions, it may be that external architecture is secondary to a myriad of factors driving more negative emotions, perceptions, and ultimate behaviors (cf. Andrade et al., 2016).

We hypothesized that the impact of hostile architecture on both Black and Latino respondents would be similar in that they have lower positive affect, greater negative affect, and less positive or cooperative behaviorally relevant perceptions as compared to White respondents in the hostile condition (H4). In looking at affect, while we did find that Black and Latino respondents were different in comparison to White respondents, they both exhibited trends opposite to our hypothesis. Specifically, when compared to White respondents in the hostile condition, Black and Latino respondents had greater levels of positive affect when shown a hostile police department.

Why are Black and Latino respondents more positive when confronted with hostile buildings than White respondents? Black and Latino respondents may not be as reactive in the face of hostile buildings due to their familiarity with hostile conditions in the U.S. Research in urban neighborhoods suggest that communities of color have historically received less resources and more divestment (see, e.g., Werner et al., 1976–1977; Squires et al., 1979), which can translate into dilapidated buildings lacking proper infrastructure. The police building itself may communicate messages to the respondent with regard to the racial, ethnic or class composition of the surrounding community.[4] Collectively, respondents of color may have built up a resilience to engaging with edifices that are indicative of these larger trends. Of course, we do not mean to suggest that these individuals prefer or thrive in hostile environments, but rather they may have learned to cope with and navigate

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[4] We neither asked survey respondents about the type of neighborhood they perceive the police building to be located in nor did we prime respondents to think about a certain type of neighborhood (e.g., giving cues of relevant geographic, sociodemographic or economic information). Thus, we were not able to empirically account for how beliefs about the neighborhood or community may mediate or moderate the effects displayed herein. As such, this discussion is primarily speculative and should be taken with caution.

around these environments better than their White counterparts, especially in light of the criminal justice system's racist history. This sort of familiarity has also been discussed in the context of public housing with regard to neighborhood transitions (see Hyra, 2008).

Race has been at the very center of policing dating back to the slavery of African Americans (Headley, 2020; Blount-Hill, n.d.). An alternative explanation lies in unpacking the effect of negative encounters with police for both Black and Latino individuals and how these stories are magnified throughout social networks, which conjure expectations of mistreatment even in those who have not directly encountered the police (Warren, 2011; Weitzer and Tuch, 2004). Discriminatory treatment by police may become, in the mind of many, just another instantiation of a ubiquitous, legalized social structure set to oppress people of color (Alexander, 2010; St. John, 2019). Episodes of police violence can become a cohesive narrative of state violence (Blount-Hill, n.d.; Desmond et al., 2016), wrapped in the context of structural racist violence (Farmer, 2004; Feagin and Bennefield, 2014), and possible evidence of an anti-black and brown world order (Curry and Curry, 2018). Thus, it may be contrary to expect any physical manifestations of police power to be a welcoming sight. Specifically, would architectural overtures of transparency be accepted as sincere and meaningful? What if welcoming buildings actually signal more resources being poured into a system designed to oppress a certain group or class of people? If more resources are being put into building "nicer" police departments, this may signal potential for greater levels of enforcement. For individuals of color who may perceive the police department as an oppositional, occupying or militarizing force, not intended to protect, but rather to apprehend and encroach on individual rights and freedom (Unnever and Gabbidon, 2011), a heavily financed or resourced building could signal the empowerment of an oppressive force and evoke feelings of incapacitation. The oppressed may naturally prefer to see the oppressor in an edifice that is not designed well, heavily invested in, or even modern. Rather, there may be a preference for resources and improvements being devoted outside of the criminal justice system altogether (McLeod, 2019).

In differentiating between Black and Latino respondents, it is important to note that the research base on Latino experiences with the criminal justice system is not as extensive as Black experiences. In one of few studies covering this subject, Hagan et al. (2005) found greater changes in Latino perceptions after negative contact with police (similar to changes exhibited by White individuals), whereas Black perceptions vary less and are more consistently negative. Yet, both Black and Latino individuals report more negative experiences with police than White individuals. Even so, Latino respondents fairing worse or better than White or Black respondents vary in directional differences across studies. In part, this may be a byproduct of the term Latino capturing persons who identify with various racial groups, as seen in the Afro-Latino movement (Flores and Román, 2009; Hernández, 2003), or excluding populations one may think are captured under Latino but are not (Alcoff, 2005; MacDonald, 2001; Urbina, 2007).

Further, if White individuals predominantly believe there is a need for the police in order to secure their safety and enhance feelings of protection (Bahn, 1979; Skogan, 2009b), then the presence of a welcoming building may reaffirm feelings of belonging. White respondents may come with positive expectations with regard to reporting crime and how they expect a police department to look, thus there may be expectation disconfirmation when presented with a hostile building, leading to White respondents exhibiting more negative feelings or discontent when their expectations are not met. Moreover, it may be that building design or architecture is not, in and of itself, neutral, but, rather, signals cues about race, ethnicity and socioeconomic status of the neighborhood it is located within – thus, in essence, buildings themselves may be racialized or classed (see Brown, 2019). Research suggests that dilapidated buildings can signal to viewers a lack of investment in a community (Massey and Denton, 1993) and that negative perceptions of race and of class are often conflated (Bonam et al., 2016). Similarly, certain spaces may be categorized and protected as

"white space," whereas "black space" is associated with stereotypical perceptions of "the ghetto" (Anderson, 2015).

Whatever the reason may be for understanding this contradictory finding, it is most important to reiterate that the interpretation of criminal justice symbols broadly speaking, and more specifically police buildings, differs based on race and ethnicity. Further, we would be remiss to not mention that when we pretested the images of police departments against our theoretical constructs as part of the pilot analysis using MTurk, the majority of these respondents were White. We do not know whether having a diverse sample of respondents rating building images based on our hostile and welcoming framework would have led to differences in categorizations across race and ethnicity in the pilot study. However, seeing as we conceptualized and categorized the images prior (based on theory) and the respondents were blind to such categorizations, the fact that numerical ratings matched our conceptual categorizations is telling.

Why are there no significant findings of building type on neither negative affect nor behaviorally relevant perceptions, even across racial and ethnic groups? While the descriptive statistics (as displayed by the graphical images) highlight racial and ethnic distinctions, the regression analyses estimating within the hostile condition and across respondents revealed null findings. This suggests that while the positive emotional arousal in respondents may differ based on racial or ethnic group and building type, one's negative emotional state or behaviorally relevant perceptions may fluctuate less. We acknowledge that only three items comprised our negative affect measure (as compared to the six items for positive affect) and that there is less variation overall in the behaviorally relevant perception measure as compared to the affective measures – e.g., more often than not respondents were highly likely to enter into the police department (one of the three behaviorally relevant perceptions that comprised our composite measure). Also, in reality, while variations exist with regard to crime reporting and race/ethnicity (see Desmond et al., 2016; cf. Xie and Lauritsen, 2012), from the beginning of the experiment we indicated to respondent's that they would in fact report the crime.

This study is not without limitations. In trying to conceptualize and operationalize hostile and welcoming archetypes, we acknowledge that perception is different across persons and it is difficult to move beyond broad principles to create lists of specific design features and dimensions that satisfy the full breadth of human preference. Moreover, the sheer volume of possible features that might be considered for a hostile or welcoming building requires much more space than provided within this study, and building appeal is judged more holistically than on the sum of its parts. However, future research can delve more deeply into specific architectural design features juxtaposed against architectural eras to understand that exact characteristics of a welcoming or hostile building. Additionally, there is a continuum of interactions that occur with buildings and it is important to understand how both exterior and interior features of buildings impact the occupants – including the public as well as employees. Specifically, further research can parse the relative importance of interior versus exterior features and the implications thereof. Since we did not ask survey respondents about how the police building cued neighborhood features or financial investments, future research can build upon this work by empirically teasing out potential differences in interpretation of similar buildings.

We acknowledge that the survey experiment may not be able to emulate actual experiences or behavior. However, prior scholars have found that pictures are acceptable stimuli to elicit emotional responses (Uhrig et al., 2016); there are connections between general perceptions from survey research and actual behavior (Bruning, 2002; Taylor and Kluemper, 2012); and that people do not always "consciously decide how to behave," rather people "might routinely be unaware of some or even many of the determinants of [their] behavior" including "social stimuli and situations" (Ferguson and Bargh, 2004, p. 37–38). More recently, in a study examining whether results from hypothetical survey experiments (using vignettes) approximated participant decisions and behaviors in real-world scenarios, Hainmueller et al. (2015) found close similarities between survey experiments and behavioral benchmarks in

the case of immigration and naturalization. That said, we would still caution against accepting our study as definitive – our attempt here is exploratory in an area heretofore little explicated, leaving much room (daresay, necessity) to improve and refine this work. More research is needed to understand the extent to which people actually choose to enter buildings based on appearances or the real emotional impact thereof (since feelings and experiences may be magnified in reality as opposed to a survey context). Relatedly, actual behaviors and behaviorally relevant perceptions may be mediated by emotions, which should be explored more meticulously.

Along these lines, we acknowledge that people often report victimization and crime via phone or online, rather than in person. Thus, when coming into contact with a police department it is not likely to be due to reporting a criminal incident. Scholars can expand beyond criminal incident reporting into other reasons that lead people to coming into contact with actual police buildings and the ways in which building design and appearance impact those behaviors (e.g., filing an officer complaint regarding misconduct). Further, there may be differences found for scenarios where people come into contact with police departments to request information or documentation as opposed to providing information. Additionally, future research should account for baseline predispositions to engaging with government institutions physically as opposed to virtually or via phone (if at all). Different methods of inquiry are also needed in order to better capture real-time as well as in-depth experiences of individuals and justice buildings. Lastly, future research should aim to include a larger respondent sample in order to run additional analyses with increased power to ensure confidence in the results.

7. Conclusion

The current study furthers our understanding of how the physical design interacts with the social world to shape perception and behaviorally relevant perceptions. Improving police-community relationships and public perceptions of policing is a primary concern of political officials, policymakers, practitioners, reform advocates, community leaders and neighborhood residents. Strategies to improve these relationships should be comprehensive, and yet current science has left untapped a wide canvas upon which positive impression management might be shaped: police buildings. It is vital to understand the ways in which physical design can inhibit or promote more positive perceptions and interactions, particularly when considering behaviors like crime reporting. Provided that (i) public cooperation and compliance with local law enforcement is essential for the safety of the public and police officers who are often the first line of defense and (ii) architecture and physical design can impact negative or positive affective responses (even if not directly impacting behaviorally relevant perceptions), then the findings of this study have implications for overall public cooperation and police-community relations. With this in mind, we are in alignment with urban designers and planners like Ifeoma Ebo who is quoted stating "if that facility does not appear welcoming or feel inviting, then people do not have that outlet to report crimes, and therefore cannot participate in this act of crime prevention in their neighborhood, and are therefore not empowered to be a part of the solution." At the same time, she cautions, "design is not the answer to all of the world's problems. If there's a desire to transform the face of their facilities, then there needs to be an authentic transformation within the institution itself" (Kinney, 2016).

In sum, this is the first study to-date proposing an experimental design to interrogate how the physical design of police buildings impacts public perception, and it breaks new ground in testing contemporary theoretical frames yet to be explored simultaneously. This study provides empirical insights and evidence for police practice and the future of police architecture. The interdisciplinary nature and relevance of this study extends beyond policing and criminal justice literature, to social psychology, architecture, and urban planning. Specifically, it shows that justice architecture has differential impacts on individuals across racial groups, in ways that may not always be intuitive, yet nevertheless

important. This finding opens up questions about racialized interpretations of architecture and the place of culture in the link between buildings and the affect and actions they may inspire.

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Appendix. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jcrimjus.2020.101747.

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