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Community Association: Exploring Interaction Effects Between Gender and Student Housing Type

STUDENTS' SENSE OF COMMUNITY is at the heart of their college success and can be impacted by many factors, including staff, programming, and hall design, as well as demographic variables such as age, ethnicity, and gender. The purpose of this study is to investigate how gender and student housing type at a faith-based institution influence sense of community (SOC). In this study 350 undergraduate students (241 women, 109 men, M age = 18.24 years; SD = 0.48) enrolled at an urban faith-based university responded to questions about their perceived sense of community in relation to their residential environment. Multiple analyses of covariance assessed participants' membership, purpose of belonging, fulfillment of needs, emotional support, and development of relationships in connection to housing type. While gender alone did not significantly impact sense of community, the interaction effect between gender and student housing type was found to be significant. Findings highlight the differentiated community experiences of men and women within residential settings, suggesting that community association is actualized differently based on students' gender and the design of residence halls. Limitations and future directions are discussed.

Receiving ample attention throughout the last five decades as an important construct in the field of community psychology, sense of community (SOC) continues to be investigated through scholarly endeavors. Social scientists employ the concept of sense of community as a lens to understand a “mutually supportive network of relationships” (Sarason, 1974, p. 1). As a framework, the development of personal relationships can be seen as the foundation that prevents sustained feelings of loneliness and isolation and nurtures a sense of

dependability among community members (McMillan & Chavis, 1986; Sarason, 1974). When members' needs are met through their association and commitment to one another, their sense of community is actualized. Experiences of community and belonging exist in a range of group contexts, culminating in a general shared understanding and belief, which for some may define a religious faith (McMillan & Chavis, 1986). As a result of its seemingly universal application, scholars use sense of community to investigate the interconnectedness of student outcomes such

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as faith development, academic success, and peer engagement with a variety of academic environments (Ferrari et al., 2009; Yang & Liu, 2008; Yasuda, 2009).

SENSE OF COMMUNITY IN RESIDENTIAL STUDENTS

Researchers who study student outcomes have collected empirical evidence of sense of community through both quantitative and qualitative methods in relation to the college or university setting (Brandon et al., 2008; Bronkema & Bowman, 2017; Devlin et al., 2008; Hill et al., 1999; Li et al., 2005), institutional mission (Bottom et al., 2013; Ferrari et al., 2009), racial identity (Ferrari et al., 2014), and gender (Hagborg, 1998; Wang et al., 2004). Despite differences in measurable levels of community in relation to such factors, conclusions persist in connecting the importance of sense of belonging, individual and group accountability, and shared community association (all attributes of SOC) to student success and retention (Jacobs & Archie, 2008).

Essential to understanding the interplay between sense of community and the physical environments found in academic settings is determining what places and spaces on a college or university campus matter most in community development. It may be more broadly understood that college students interface with their peers, faculty, administration, and staff in a lecture hall/classroom, through online a/synchronous learning, in a science laboratory, or on an athletic field. Residence halls are also thought to contribute to formation of a sense of community, as these living spaces play an important role in in-

creasing opportunities for group affinity and shared association, which are positively correlated with student persistence (Erb et al., 2015). As such, the interconnectedness between student outcomes and living environments remains a top priority for many campus leaders as they seek opportunities for student housing facilities to more intentionally promote academic and social community development (Heasley et al., 2015; Treanor Architects, 2011).

Building or maintaining sense of community among college and university students may be difficult as individual experiences in various campus environments are uniquely different for each person (Bottom et al., 2013; Bronkema & Bowman, 2017; Khozaei et al., 2014). Still, a desire to influence community development through student housing space and facility design may be advantageous, especially for institutions hoping that residence hall renovation projects or new construction will attract and retain new students (Heasley et al., 2015). Uniquely understanding the varying perspectives and lenses through which students experience physical space may help in decision-making processes connected to campus master planning and inevitably student success. However, insufficient attention has been given to examining the apparent relationship between student outcomes and lived experiences in on-campus housing (Bronkema & Bowman, 2017; Devlin et al., 2008; Hill et al., 1999), especially in consideration of the interaction effects between gender differences and campus housing type. Contributions within this realm of scholarship are even rarer within the context

of a private faith-based university. With this premise, the content provided herein underscores the purpose of understanding how gender and student housing type at a faith-based institution influence sense of community. More specifically, the importance of investigating this relationship at faith-based institutions can be viewed as being two-fold. Foremost, it is vital to provide real application of student experiences, rather than relying on commonplace practices of broadly applying noted student outcomes from large public institutions. Additionally, spiritual development and connection to institutional mission play different roles in how students experience sense of community in campus residences at faith-based institutions than they do in their peers at public universities.

INFLUENCE OF HALL DESIGN AND GENDER ON COMMUNITY DEVELOPMENT

Research focused on student housing design garnered increased attention throughout the 1960s and 1970s. A surge in student housing construction in response to the increased enrollment of returning wartime service personnel led to early studies investigating the influence of residence hall design on student outcomes (Baum & Davis, 1980; Baum et al., 1975; Bickerman et al., 1973; Crane, 1962; Heilweil, 1973; Valins & Baum, 1973; Wilcox & Holahan, 1976). Seminal research on the influence of architectural design on human behavior spurred investigations into campus design and specifically residence hall settings, with a focus on room type arrangements and their relationship to

crowding and student behavior. In one such study, Baum et al. (1975) reported higher levels of perceived crowding from students in traditional corridor-style housing than were reported by those in suite-style housing. Conventional operant definitions describe corridor-style configurations as double-occupancy rooms opening directly off of a single corridor, with a shared bathroom for occupants of the corridor, while suite-style configurations consist of several rooms (typically four to eight double-occupancy bedrooms) clustered around a shared common living area and/or bathroom facility.

Further research efforts of this era complement these findings, concluding that what students perceived of as the spatial disorganization of corridor-style housing increased their sense of overcrowding (Baum & Davis, 1980). Other studies revealed that residents of suite-style halls were troubled by disruptive, unwelcomed interactions with persons roaming the halls; the unpredictability of social interactions with other hall residents (Valins & Baum, 1973); and restricted social group formation—all of which inhibited their sense of community (Heilweil, 1973). All in all, formative work in this field led to understanding that “architectural variables exert significant influences on the social climate of university residence environments” (Wilcox & Holahan, 1976, p. 456). In spite of research findings confirming connections between student experiences and residence hall design, interest in studying student housing arrangements waned considerably beginning in the early 1980s. Even still, there is another student housing configuration that

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remained virtually unstudied by comparison: conversions of single-family homes into single-gender student accommodations. These stand-alone facilities were considerably smaller than contemporary residence halls, which are more heavily populated. Based on a common arrangement, campus houses typically sleep 15–40 students and offer communal lounge spaces, shared bathrooms, and a variety of room sizes. The lack of more recent scholarship on the influence of varying residence hall design types on sense of community certainly indicates a missed opportunity for research, yet what remains even more important is seeking to understanding how hall design can help increase SOC when there are opportunities for and access to peer networks, social support, and community affiliations (Heasley et al., 2015).

Beyond arguments supporting the need to address deficiencies in scholarly work merely for the sake of knowledge, the lack of research in this realm has real implications. Scholars suggest that without new data on sense of community and its connection to hall design, practitioners may be left speculating on how to best support important areas such as peer networks and relationships, access to social support, and opportunities for communal association when deciding on the designs for hall renovation or new student housing projects (Devlin et al., 2008; Heasley et al., 2015; Khozaei et al., 2014). Short-sightedness in exploring how hall design influences sense of community may result in decreased peer support, a lack of shared emotional connection, and increased social isolation (Heasley et al., 2020). These negative experiences may then lead to a sense of disenfranchisement within the campus community, decreased sense of belonging, and greater loneliness among residents.

Recognizing a gap in research, current studies of student housing are increasingly focused on the common thread of evaluating residential student outcomes based on interactions with paraprofessional and professional staff (Boone, 2018; Brandt Brecheisen, 2015; Everett & Loftus, 2011; Healea, 2015), academic programming (Buell et al., 2017; Longerbeam et al., 2007; Spanierman et al., 2013), and faculty engagement both from the context of student learning and community impact (Frazier & Eighmy, 2012; Rombough & Johnson, 2015). However, few scholarly pursuits investigate how student outcomes are influenced by the physical space in residential settings, and even fewer consider gender differences within specific campus contexts (such as campus size, public versus private, and geographic location). Still, some past studies highlight differences based on housing population density and occupancy (Devlin et al., 2008; Hill et al., 1999), design characteristics and amenities (Devlin et al., 2008; Heasley et al., 2020; Khozaei et al., 2014; Meir et al., 2007), and students' satisfaction with their social environment as a predictor for academic success (Bronkema & Bowman, 2017; Li et al., 2007; Wang et al., 2004). Moreover, select scholars also report notable findings on gender effects within student housing (Amole, 2005, 2009a, 2009b; Kaya & Erkip, 2001; Najib et al., 2012).

Interest in understanding gender differences within student housing has been spurred by some scholars, with a limited number of studies taking place both internationally and domestically. Within this collection of scholarly work, gender is identified as an indicator in determining students' satisfaction or dissatisfaction with residential college experiences. First and foremost, of notable significance are the studies by Bottom et al. (2013) and Ferrari et al. (2009, 2014),

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who bring attention to the influence of additional attributes of social identity (such as multiracial and gender non-binary categorization) in SOC development for students at faith-based institutions. These scholars situate their work in understanding the inclusion and religious pluralism inherent in SOC formation. They further contend that the construct of sense of community may be perceived differently based on one's community affiliations because of varying "levels of social support, participation in community groups, and alienation" (Bottom et al., 2013, p. 12; also see Bishop et al., 2002).

Exploring elements of sense of community, such as communal support, group association, and peer isolation, also resonates with the findings of other researchers who explore student perceptions of SOC based on gender and elements of building design such as hall density, communal space, and individual privacy. Specifically, a noteworthy finding among multiple authors is that women report that a shared living experience in less crowded facilities is most favorable (Amole, 2005; Kaya & Erkip, 2001). Conversely, while men enjoy access to shared spaces, they prefer more private living accommodations (Amole, 2005; Li et al., 2007). Similarly, Meir et al. (2007) reported that men tend to use personal space for rest, sleep, and study, whereas women utilized their bedroom to engage in social interactions and develop friendships. For these reasons, Li et al. (2007) posited that the tendency to feel greater satisfaction with the overall campus housing experience is higher among female students than it is

among male students. Despite some limitations in generalizability based on scope, context, and regionality, specific discoveries from these scholars are worthy to reference when trying to make sense of and more deeply understand the interaction effects of gender and space.

Common themes among contemporary studies are the existence of experiential differences based on the configuration, size, and function of residence hall room types. Notably, two floor plan configurations (traditional corridor-style and suite-style) monopolize the research landscape of studies investigating arrangement effects on student experiences. Brandon et al. (2008) discuss the community association formed as a result of residents' experiences within these specific student housing design types. Social experiences take place in private student rooms within traditional corridor-style halls, but in suite-style floor plans, communal areas such as lounges and shared bathrooms are designated as social space for residents (Khozaei et al., 2014). Building layout and design are often approached with the intentionality of increasing specific types of human interactions. Those examined by Brandon et al. (2008) relate to specific components of communal association—fostering a sense of belonging, fulfilling needs, experiencing influential inclinations, and engaging in emotional connectedness to others—that can be enhanced by the layout of a building. Even though students reported different frequencies and locations of interactions based on the layout of the floor plan, differences in interaction type were not noted. In another study, Devlin

et al. (2008) explored how sense of community is impacted by residence hall architectural design. In concert with other scholars, they highlight the influence of building design and size as factors contributing to sense of community. However, in contrast to studies performed 30 years prior (Baum & Davis, 1980; Baum et al., 1975; Valins & Baum, 1973), Devlin et al. (2008) report that corridor-style arrangements are more favorable than are other layouts in developing community association. Such findings are further supported in more recent scholarly research revealing that students who reside in suite-style residence halls report less of a sense of community than do peers in traditional room configurations (Bronkema & Bowman, 2017). This phenomenon is explained as the result of the decreased likelihood that residents will extend themselves socially outside of the enclosed spaces inherent in suite-style configurations. In summation, conflicting findings suggest there are benefits and limitations associated with each design type.

In response to a lack of contemporary literature, this study examines the influence of gender and floor plan design on the SOC outcomes of undergraduate students based on their residential experience at an urban faith-based university. Comprehensively understanding the impact that gender differences may have on SOC outcomes seems even more relevant when placed in the context of meeting the developmental needs of students. Enhancing sense of community attributes such as a sense of belonging, indi-

vidual and group accountability, and shared community association can lead to greater student success and retention (Jacobs & Archie, 2008) and may be particularly germane for private faith-based universities that seek to provide lasting student connectedness to their campus and mission.

THEORETICAL FRAMEWORK

Sense of community is defined by Peterson et al. (2008, p. 62) as a “fundamental human phenomenon of collective experience.” As a construct associated with measuring individuals’ experience of community across a range of group contexts (McMillan & Chavis 1986; Sarason, 1974), the notion of community is often differentiated into two constructs: territorial, which is related to geographic location, and rational, which is based on the character of human relationships (Gusfield, 1975). The latter construct, in which people are drawn to one another by similar interests rather than by location, is most fitting for examining gender differences within a residential college or university environment (Durheim, 1964; Gusfield, 1975). Encompassed in the rational perspective, sense of community comprises four elements: *membership*, *influence*, *reinforcement through integration and fulfillment of needs*, and *shared emotional connection* (McMillan & Chavis, 1986, p. 9). The complexities of and dynamics between these elements can be difficult to understand, as elements of the model may often be intertwined throughout a sequence of events and experiences.

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Membership is broadly defined as boundaries delineating who does and does not belong within the community association (McMillan & Chavis, 1986); commitment to one another provides an emotional vulnerability leading to community investment (Chavis et al., 2008). *Influence* involves a sense of mattering and is defined by a reciprocal relationship in which an individual contributes to the overall well-being of the community and, in turn, receives valuable supports from other members (Chavis et al., 1986; Heasley et al., 2020). *Reinforcement through the integration and fulfillment of needs*, a cornerstone to behavioral research, emphasizes community togetherness by serving as a motivator for desired behavior. Integration and fulfillment of needs involves measurable outcomes such as status, competence, and shared values to achieving community devotedness (Chavis et al., 2008; Heasley et al., 2020). *Shared emotional connection* is the belief that a shared history, space, togetherness, and experiences will develop and enhance an obligation to the membership (McMillan & Chavis, 1986). Associations are strengthened by events that offer individual and communal opportunities for emotional investment. Working singularly or in concert, these elements can enhance connectedness to others (Heasley et al., 2020).

METHOD

Methods used to analyze differences of the main and interactive effects of independent variables (gender and floor plan design) on sense of community are the focus of this study. Differences in outcomes are investigated for undergraduate students enrolled at an urban faith-based university in the north-eastern region of the United States. The central research question is *What are the differ-*

ences in students' SOC based on student housing type and gender? Answering this involves investigating three related questions: *Are SOC outcomes differentiated by student housing type? How does gender influence SOC?* and *What are the main and interactive effects of student housing type and gender on students' SOC?*

Specific to this study, the first independent variable was student housing type, which was subcategorized into three basic hall configurations (corridor-style, suite-style, and campus house). In corridor-style housing, 25–30 double-occupancy rooms open directly off of a double-loaded corridor, with rooms directly across from one another down the length of the hallway. Residents share community bathrooms and, in some cases, small lounge areas. Suite-style housing is arranged in a cluster form, with four to eight double-occupancy rooms opening off of a single hallway. Within suite arrangements, students share a common living area and bathroom facility. In single-gender campus houses, each student room offers a unique layout. As converted single-family homes, campus houses offer a myriad of room configurations with varied occupancy. Some are private, single-occupancy spaces, while others may be shared by four students. The total occupancy for a campus house ranges from 15 to 40 students, which is considerably smaller than the 350+ person capacities associated with the other two housing types in this study.

Gender identity was the second independent variable in this study. On the survey instrument participants were given four choices for gender identity: woman, man, gender non-binary, and other. Based on low participant selection of non-binary ($n = 1$) and other ($n = 0$) categories, only binary gender selections were used in study analysis.

Procedures

After gaining Internal Review Board (IRB) approval at the host site, data collection occurred through deployment of an online survey instrument, which was created and hosted on QuestionPro.com, an electronic survey development program. Data gathered on the survey included bio-demographic information and responses to SOC as measured across its six subscales (reinforcement of needs, membership, influence, shared emotional connection, involvement, and emotional support). First, during mid-October of the 2019 fall term an announcement was emailed to all students residing in corridor-style, suite-style, and campus houses. Participants were given two weeks to complete the online survey with one email reminder sent seven days after the initial request reminding those who had not already done so to kindly consider participating in the research study. Data received from completed surveys were downloaded directly into an EXCEL data table and subsequently uploaded into a statistical analysis computer software program, SPSS, for analysis.

Participants

For sampling, a non-probability, purposive selection of typical cases was employed (Coyne, 1997). This strategy intentionally provides access to participations who have direct experience with the phenomenon of interest. This study's participants included 350 undergraduate students from the same urban faith-based university, representing 25.4% of the eligible on-campus residential population. Gender distribution among survey respondents was 109 men, representing 31.3% of total responses, and 241 women, representing 68.6% of total responses. First-year students represented 88.2% of study participants, with second-year students accounting for 11.2%. The remaining were third-year class status. Seventy-seven

percent of participants were 18 years old at the time of participation ($M = 18.25$, $SD = 0.48$); the remaining participants were between the ages of 19 and 21 years old. Overwhelmingly, participants self-identified as White/Caucasian (88.8%), followed by Hispanic/Latino (3.7%), Asian (3.7%), African American/Black (2.6%), other (0.9%), and Pacific Islander (0.3%).

Student housing type participation percentages align closely with the overall residential population from each hall type at the university. From the total 1,380 students in on-campus residences, 49.2% resided in corridor-style housing, 39.5% lived in suite-style accommodations, and the remaining 11.3% were residents in campus houses. Similarly, among the 350 individual survey responses, corridor-style housing represented 49.5% of total cases, suite-style floor plan design represented 38.5%, and campus houses represented 12.0%.

Another important consideration is how housing was determined for participants. All students in this study were administratively assigned to their housing placement. With the exception of special considerations given to students with documented need and also for select athletes attending the institution on a full athletic scholarship, an opportunity to rank housing type was not offered to the study participants; they received their housing assignment based on a randomized process facilitated by administrative housing staff. Because of this practice, all student housing in this study was offered at the same price. These practices help mitigate cost and housing selection as confounding variables in this study.

Psychometric Measure

Components from two existing inventories measured the SOC paradigm in this study.

... women report that a shared living experience in less crowded facilities is most favorable. Conversely, while men enjoy access to shared spaces, they prefer more private living accommodations.

Revised from the original Sense of Community Index SCI-1 (Chavis et al., 1986), all 24 items on the Sense of Community Index version 2, abbreviated as SCI-2 (Chavis et al., 2008), combined with eight items from the relationship dimension subscale of Moos and Gerst's (1974) University Residence Environment Scale (URES), collected data on SOC and housing type. The word "community" was intentionally substituted for the word "dorm" in order to provide more clarity for the respondents. However, there were a few instances where "dorm" was merely added as an adjective to modify the term "community." For example, "Being a member of this dorm is a part of my identity" illustrates a substitution of the word "dorm" for the term "community," and "I can trust people in this dorm community" is an example of the addition of the word "dorm" as an adjective. Participant responses to survey items were based on a four-point itemized scale: 1 = Not at all; 2 = Somewhat; 3 = Mostly; and 4 = Completely. On the survey there were six items used to measure each of the following subscales: reinforcement of needs (RON), membership (MBP), influence (INF), shared emotional connection (SEC); the last two subscales, involvement (INV) and emotional support (ESP), were each measured across four items on the instrument.

Chavis et al. (2008) reported a Cronbach's alpha for this instrument of 0.94. Subscales also prove reliable, with internal consistency alphas that ranged from .79 to .86 (Chavis et al., 2008). Cronbach's alpha for the relationship dimension subscale of the URES is 0.82 (Moos & Gerst, 1974).

Utilization of McMillan and Chavis' (1986) sense of community theoretical framework enhanced external validity (Pallant, 2016), as analytical findings from this study reflected the broader theory.

Data Analysis

SPSS was used to complete both descriptive and inferential analysis. Preliminary parametric analysis measured the degree of linear relationship among dependent variables (as measured by the SCI-2 and URES) using Pearson Product-Moment Correlation Coefficient (r), truncated as correlation coefficient (Pallant, 2016). Subsequently, a one-way MANOVA, an inferential technique used to evaluate the initial hypotheses, analyzed differences in SOC across residence hall type. To investigate whether a statistically significant interaction effect was present for residence hall design and gender on SOC, a two-way MANOVA was conducted representing a 2 (men vs. women) $\times$ 3 (corridor-style, suite-style, and campus house) analysis across the six dependent variables. Lastly, simple main effects analysis was conducted to explore the exact nature of the interactions between the two independent variable types (each specific hall design and each gender category) across the six subscales of the SOC construct.

RESULTS

In assessing the participants' network of relationships and connectedness to campus culture through shared community association, two related outcomes were hypothesized regarding the influence of student housing

type and gender on sense of community. Informed by the prior work of Amole (2005), Devlin et al. (2008), and Kaya and Erkip (2001), it was expected that significant differences would exist in students' SOC mean scores based on student housing type and gender. In consideration of there being a perceivable social interaction balance between private and shared space, corridor-style student housing type was hypothesized to yield higher mean SOC scores than were other student housing types, especially for women. Before hypothesis testing ensued, intercorrelations among scales were performed.

Intercorrelations Among Scales

Correlations among the six subscales of SOC (reinforcement of needs, membership, influence, shared emotional connection, involvement, and emotional support) were positive and statistically significant. Findings indicated that only the relationship

between the membership (MBP) subscale of the SCI-2 and the emotional support (ESP) subscale of the URES was moderate in strength, $r = .436$, $n = 350$, $p < .005$ (see Table 1). All other results yielded strong, positive correlations between associated variables ($p < .005$, two-tailed), indicating that high levels of SOC outcomes are associated with higher levels of involvement and emotional support in relation to residence hall design.

Inferential Analysis

MANOVA results indicated a statistically significant difference in the influence of residence hall design types on the combined dependent variables, $F(2, 348) = 2.48$, $p < .005$; Wilks' Lambda = 0.92; partial eta squared = .04 (see Table 2). The following six dependent variables were used: reinforcement of needs, membership, influence, shared emotional connection (derived from the SCI-2 survey), and involvement

TABLE 1

Pearson Correlations SCI-2 and URES

	RON	MBP	INF	SEC	INV	ESP
RON	1.000	.732**	.750**	.785**	.548**	.511**
MBP	.732**	1.000	.765**	.765**	.528**	.436**
INF	.750**	.765**	1.000	.803**	.531**	.463**
SEC	.785**	.765**	.803**	1.000	.611**	.525**
INV	.548**	.528**	.531**	.611**	1.000	.624**
ESP	.511**	.436**	.463**	.525**	.624**	1.000

** Correlation is significant at the $p < .005$ level (2-tailed).

Note: $N = 350$ for all correlations.

Concepts based on Chavis, Lee, and Acosta (2008): RON = reinforcement of needs, MBP = membership, INF = influence, SEC = shared emotional connection.

Concepts based on Moos and Gerst (1974): The relationship dimension of the URES consists of INV = involvement and ESP = emotional support.

and emotional support (from the URES survey items). The level of significance found in this analysis promoted further investigation into the relationship of the independent variable (hall design types) on each subscale separately. Practically speaking, this finding affirmed that students do have different levels of SOC outcomes based on their experiences with select types of residence hall designs.

Results of the two-way MANOVA confirmed that gender combined with residence hall design type offered statistically significant interaction effects with regard to SOC outcomes for residence hall students. Based on the exploratory nature of this analysis, Roy's Largest Root with significance at the .005 level, rather than Wilk's Lambda, was used, $F(5, 344) = 3.21, p < .005$; Roy's Largest Root = .06; partial eta squared = .05 (see Table 3). Interestingly, gender alone was not

TABLE 2
MANOVA Sense of Community and Residence Hall Design Type

EFFECT	VALUE	F	HYPOTHESIS df	ERROR df	SIG.	PARTIAL ETA SQUARED
Pillai's Trace	.083	2.48	12.00	688.00	.004	.041
Wilks' Lambda	.919	2.48 ^a	12.00	686.00	.004	.042
Hotelling's Trace	.087	2.48	12.00	684.00	.004	.042
Roy's Largest Root	.060	3.45 ^b	6.00	344.00	.003	.057

^aExact statistic.
^bThe statistic is an upper bound on *F* that yields a lower bound on the significance level.

TABLE 3
MANOVA Sense of Community for Residence Hall Design Type and Gender

EFFECT	VALUE	F	HYPOTHESIS df	ERROR df	SIG.	PARTIAL ETA SQUARED
Pillai's Trace	.055	1.60	12.00	680.00	.086	.028
Wilks' Lambda	.945	1.62 ^a	12.00	678.00	.081	.028
Hotelling's Trace	.058	1.64	12.00	676.00	.077	.028
Roy's Largest Root	.057	3.21 ^b	6.00	340.00	.004	.054

^aExact statistic.
^bThe statistic is an upper bound on *F* that yields a lower bound on the significance level.

statistically significant; however, the interaction effect between gender and residence hall design was found to be significant. In other words, findings from this analysis suggest that differences in SOC outcomes are associated with gender and hall design working in tandem.

Significant main effects were also found for five of the six subscales. Notably, only the between-subjects effect for emotional support (ESP) was not statistically significant. Significant interaction effects between residence hall type and gender were as follows: SCI-2 reinforcement of needs (RON), $F(2, 344) = 4.89, p < .010$; SCI-2 membership (MBP), $F(2, 344) = 8.48, p < .001$; SCI-2 influence (INF), $F(2, 344) = 5.42, p = .005$; SCI-2 shared emotional connection (SEC), $F(2, 344) = 5.95, p < .005$; and URES involvement (INV), $F(2, 344) = 6.01, p < .005$ (see Table 4). However, unequal cases for each

residence design type (particularly when comparing campus house cases in relation to corridor-style and suite-style subject counts) rendered utilizing post-hoc tests ineffective. Despite concerns over conceptual error rate and taking into consideration the subjective nature of such tests, simple main effects analysis was conducted for the five significant subscales to explore the effect of one independent variable within one level of a second independent variable.

Simple main effects analysis indicated that women in campus houses experienced higher levels of SOC across all subscales than did men in the same housing type: reinforcement of needs ($p < .010$); membership ($p < .005$); influence ($p < .010$); shared emotional connection ($p < .005$); involvement ($p < .005$); and emotional support ($p = .013$). On the contrary, within the membership and influence subscales, men in

TABLE 4

ANOVA(s) Sense of Community for Gender and Residence Hall Design Type

	SUM OF SQUARES	df	MEAN SQUARE	F	SIG.	PARTIAL ETA SQUARED
SCI-2 - Reinforcement of Needs (RON)	4.16	2	2.08	4.89	.008	.028
SCI-2 - Membership (MBP)	7.24	2	3.62	8.48	.000	.047
SCI-2 - Influence (INF)	4.05	2	2.03	5.42	.005	.031
SCI-2 - Shared Emotional Connection (SEC)	6.50	2	3.25	5.95	.003	.033
URES - Involvement (INV)	1.15	2	.58	6.01	.003	.034
URES - Emotional Support (ESP)	.47	2	.23	2.61	.075	.015

Note: Concepts based on Chavis, Lee, and Acosta (2008): RON = reinforcement of needs, MBP = membership, INF = influence, SEC = shared emotional connection.

Concepts based on Moos and Gerst (1974): The relationship dimension of the URES consists of INV = involvement and ESP = emotional support.

suite-style accommodations reported higher membership scores than did women: membership ($p < .005$) and influence ($p < .050$). There were no significant differences noted between genders for students in corridor-style housing. Graphic representation of these effects is provided in Figure 1. Tests of simple main effects can be useful in interpreting interactions. Still, as per reasons previously mentioned, simple main effects results should be considered suggestive and not definitive.

DISCUSSION

As hypothesized, a significant difference for SOC was found for the interaction effect of residence hall type and gender. These results

support findings from previous researchers. Particularly, past scholars note that sense of community is related to the design of the environment (Bronkema & Bowman, 2017; Khozaei et al., 2014; Riger & Lavrakas, 1981; Zaff & Devlin, 1998). Recognizing gender differences may seem somewhat intuitive, as “men and women confront aspects of their development in different ways” (Blimling, 2015, p. 29). Still, while some previous scholars document influential interactions in consideration of gender and space (Devlin et al., 2008; Eshbaugh, 2008; Schoemer & McConnell, 1970; Scott, 1975; Wang et al., 2004), findings from this study provide an update to extant literature by indicating that gender alone is not significantly associated

FIGURE 1
SOC and Gender Difference Illustration (Simple Main Effects)

DEPENDENT VARIABLES FOR SC1-2/URES							
Residence Hall Design Type		Reinforcement of Needs (RON)	Membership (MBP)	Influence (INF)	Shared Emotional Connection (SEC)	Involvement (INV)	Emotional Support (ESP)
	Corridor-Style	Men Higher Mean Score	Men Higher Mean Score	Men Higher Mean Score	Women Higher Mean Score	Men Higher Mean Score	Women Higher Mean Score
	Suite-Style	Men Higher Mean Score	Men Higher Mean Score*	Men Higher Mean Score*	Men Higher Mean Score	Men Higher Mean Score	Men Higher Mean Score
	Campus House	Women Higher Mean Score*	Women Higher Mean Score*	Women Higher Mean Score*	Women Higher Mean Score*	Women Higher Mean Score*	Women Higher Mean Score*

*The mean difference is significant at the $p < .05$ level.

with SOC within student housing settings, suggesting that residence hall design must also be considered.

Influence of Hall Design

Hall design matters. Significant main effects for SOC, when grouping participants by hall design type, validate the efforts of past scholars who explored hall type influences on student outcomes (Brandon et al., 2008; Devlin et al., 2008; Heasley et al., 2020; Hill et al., 1999). Often researchers sought a response to the following question: Is there a residence hall design type that definitively offers higher SOC outcomes? Attempts at responding to this inquiry began nearly 50 years ago, by scholars who sought to bring greater clarity to the interactive role of student housing design and environmental effects (Baum et al., 1975; Corbett, 1973). This study adds to this growing field of work by updating findings from those of 50 years prior.

Findings from this study reaffirm higher SOC scores in relation to factors that lead to enhanced student engagement in group activities and social interactions. Despite differences among elements of SOC in student outcomes based on residence hall type as noted in this study and among other past researchers, as a collective whole, design plays a significant role in influencing the social climate of college and university residential environments (Baum et al., 1975; Corbett, 1973; Devlin et al., 2008; Wilcox & Holahan, 1976). Previous scholars confirm that architectural decisions with relation to open space access, individual privacy, and proximity to

hall resources and amenities matter for student residents. Results from this study's analysis reveal that student engagement in group activities and social interactions is favorably associated with opportunities for communal association. Even more so, differences in SOC, as reported by residents of varying residence hall design types, seem to be substantiated and perhaps exacerbated when viewed through the complex identity of gender.

Interaction Effect of Hall Design and Gender Identity

Although researchers of the 1970s concluded that corridor-style accommodations were inferior to more open design concepts such as suite-style housing (Baum et al., 1975; Corbett, 1973), results from the present study suggest a change in this experience, especially for women. Of notable importance, sense of community among women was higher across all six subscales in campus house accommodations (Figure 1). In stark contrast, men reported higher SOC development in suite-style halls. Corridor-style hall design presented a mixed response, with only shared emotional connection (SEC) and emotional support (ESP) experiences higher among women. Further investigation of gender differences in SOC formation in corridor-style hall living seems appropriate given these findings. Yet the statistically significant results of the interaction effects of residence design type and gender on SOC reported in this study aid in understanding how bedroom privacy and the sharing of common space in suite-style hall design may lead to

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higher SOC being reported by men. However, as SOC outcomes for women were dramatically and consistently higher in campus house arrangements than in the other two design options, it is possible that women prefer campus houses because they tend to offer larger bedrooms, lower room/hall occupancy, and more individual amenities. Devlin et al. (2008) confirmed this notion when they concluded that women found these characteristics more attractive and conducive to increased community association.

Understanding why differences exist between women and men is beyond the scope of this study; however, the work of more recent research teams on the impact of residence hall design on student interactions might provide a rationale for such results. Specifically, scholarly contributions from Brandon et al. (2008), Bronkema and Bowman (2017), and Devlin et al. (2008) assert that hall design that provides lower in-room density is a superior floor plan option because of its ability to increase frequency of interactions and formation of friendships among residents throughout the entire facility. Results from the present study update the conclusions of these contemporary scholars by further determining differences between men and women, wherein women report lower SOC development in shared, open-floor plans than did men. Furthermore, and remaining open for interpretation, the reasons for higher SOC scores among women in campus houses and men in suite-style accommodations may also be based on setting-specific factors, such as institutional type, location, and size. Perhaps more promise lies in understanding SOC's

interconnection and relationship to social interactions (McMillan & Chavis, 1986; Unger & Wandersman, 1983; Wilcox & Holahan, 1976) and how design may inhibit or deter such experiences (Heasley et al., 2015) differently for women and men. As campuses grapple with how to create sustainable community association in student housing, consideration of hall design and the gender of residents assigned to reside within its walls may provide insight into the type of sense of community that will be experienced among its inhabitants. Lastly, results from this study suggest that decreasing hall density, regardless of design layout, is associated with higher overall SOC as reported by both women and men.

Implications for Higher Education

A substantial number of higher education institutions in the American educational system offer student housing. Yet despite the abundance of and continued renovation and development of student housing on college campuses, there is little research available to assist designers and planners in building structures that add to a sense of community in residential settings. Studies on this topic that are performed at faith-based institutions are even more scant. In consideration of three common student housing types available for student occupancy (corridor-style, suite-style, and single-gender campus houses), the general findings of this study reveal that design type and gender are associated with community affinity differently for women and men. However, the ability of university administrators, architects, and designers to build residential facilities that enhance

... without new data on sense of community and its connection to hall design, practitioners may be left speculating on how to best support important areas such as peer networks and relationships, access to social support, and opportunities for communal association when deciding on the designs for hall renovation or new student housing projects.

SOC outcomes among students seems very plausible. Findings further suggest that understanding how design type and gender interact in residential environments warrants consideration, especially if sense of community is a desired outcome of the residential experience. In other words, it is important to study the effects of architectural design relative to gender identity and its impact on community association.

In terms of faith-based institutions in particular, results from this study situate applicable findings in a relational setting. Furthermore, given the priority of spiritual development and connection to the institutional mission, which is often espoused at faith-based institutions, taking note of the differences between the results of this study and those conducted at large public universities is seemingly appropriate. Merit also lies in considering intersections between the work of Bottom et al. (2013) and Ferrari et al. (2009, 2014), which explores the inclusion and religious pluralism inherent in SOC development and the influence of on-campus living arrangements on such formation. This connection seems reasonable based on the differentiated perceptions of communal association established through varied social support, engagement in affinity groups, and alienation. Leaders of faith-based schools are also called upon to reflect with intention and to think more deeply about the design choices of each residence hall in relation to the intended gender of its inhabitants, as such considerations may influence how community will be experienced within its walls.

Lastly, the methodology employed for this study provides an adaptable model that university administrators and scholar practitioners can use to drive decision-making processes on the type of residence halls to build on their campuses. Such a model will allow higher education institutions to make more informed decisions, reinforced by research, with regard to selecting the appropriate architectural design to support their ideal residential hall community.

LIMITATIONS AND FUTURE DIRECTIONS

The present study has limitations. First and foremost, focusing on student experiences at only one institution of higher education is a limitation. Though this study's findings contribute to the growing knowledge of work on SOC outcomes for residential college students, more work in this area is needed to expand generalizability to other schools and hall designs. Still, it is believed that the findings herein are translatable to varying institutional types and provide insight into inherent connections between architectural design and community. Another limitation is the ever-growing need to expand the way gender is studied within the field of social science research. Here, findings reported the interaction effect of binary gender categories (women and men) in single-gender accommodations. Interestingly, while the topic of coed residence halls fueled much discourse in the 1970s, today the relatively new concept of gender-inclusive housing—a living arrangement in which students elect

to reside in a room with a person regardless of assigned sex, sexual orientation, gender identity, or gender expression (The Ohio State University, 2021)—is fostering similar criticism from multiple social groups. In response, future studies need to investigate the difference in sense of community among single-gender, coeducational, and gender-inclusive hall arrangements. Lastly, it is worth noting that data collection and analysis for the present study were done prior to the onset of the COVID-19 pandemic in 2020, so the conclusions drawn herein may be further limited if a new normal is substantially different if and when the pandemic subsides.

In sum, the researcher proposed and assessed sense of community (McMillan & Chavis, 1986) within a residential setting to determine the influence of design type and gender on community association. Despite the need for intentional accommodations that promote academic and social success

through community association, the field of scholarly work remains relatively devoid of current studies central to this topic. As Dittoe and Porter (2007) comment, “With declining retention and graduation rates, education institutions are acknowledging the importance of creating spaces that appeal to students and foster learning” (p. 26). Contributing to research on students’ sense of community, the present study provided evidence that student housing type and gender may be important factors to consider in residence hall construction in academic settings. This may be particularly germane for universities and colleges experiencing wavering enrollment, retention, and fiscal security within an ever-competitive college admissions landscape in the post-COVID-19 pandemic era. Future research, then, should aim to affirm the importance of both individual and building factors essential in developing community belonging. ■

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DISCUSSION QUESTIONS

1. The author notes a sharp decline in research on residence hall design throughout the 1980s. What do you think caused this decline? What research topics would be of benefit now in terms of residence hall design and configuration?
2. What trends have you observed in community living designs and renovations intended to promote sense of community? What programmatic initiatives exist that might provide further support for the design elements in increasing sense of community?
3. Sense of community among women in the study was higher across all six subscales for campus house accommodations: reinforcement of needs, membership, influence, shared emotional connection, involvement, and emotional support. Acknowledging the limitations of building campus houses at many institutions, how might these insights provide other generalizable possibilities for residence hall design?
4. As understandings of gender continue evolving, how might more expansive conceptions of gender relate with students' SOC in residential spaces, particularly considering residence hall design of gender-inclusive spaces?
5. How might sense of community metrics be applied to understand the residential experience in other areas on college and university campuses?

Discussion questions developed by James "J. C." Stoner, associate director for housing operations at The University of Texas at Dallas, and Amanda Mollet, assistant professor of higher education administration at The University of Kansas.