

THESIS

TINY HOUSE COMMUNITIES: A MODEL FOR SUSTAINABILITY

Submitted by

Severin Mangold

Department of Sociology

In partial fulfillment of the requirements

For the Degree of Master of Arts

Colorado State University

Fort Collins, Colorado

Spring 2021

Master's Committee:

Advisor: Anthony Roberts

Patrick Mahoney
Philip Cafaro

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ABSTRACT

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At a time when the human population faces extreme environmental risks from the release of greenhouse gases into the atmosphere, a search for environmentally sustainable solutions is necessary. A recent iteration of the cohousing movement in the United States is pushing for more sustainable lifestyles by developing communities of ‘tiny houses’. Tiny house communities offer a plausible solution to climate change due to their reduced carbon footprint, increased focus on living with less, and overall escape from debt. More importantly, recent research shows tiny house enthusiasts embody environmentalist tenets within their drive to live with less in a smaller space. However, little research examines how living in these communities promotes pro-environmental behaviors and attitudes. This study addresses this gap using two original surveys to examine (1) the motivations, philosophies, and socio-demographics of tiny communities and (2) the effect of community integration on pro-environmental attitudes and behaviors in these communities. I argue that community integration plays a key role in increasing the environmentalism of tiny house community residents. Tiny house community members’ levels of pro-environmental behaviors increase as a result of being highly integrated into their communities. While members tend to already exhibit high levels of environmentalism prior to joining a tiny house community, being in the presence of others and forming relationships with other community members creates a synergistic effect that specifically increases levels of pro-environmental behaviors. The more socially integrated members are the more exposed they are to new pro-environmental behaviors that they might not been aware of prior to joining the community.

The first survey identifies the motivations, philosophical influences, and socio-demographics of tiny house enthusiasts. Sociodemographic questions included questions about respondents age, income, education level, race, and gender. The second survey asked participants to rate their levels of pro-environmental attitudes and behaviors, in addition to questions about community attachment, community integration, community impact, and basic sociodemographic about their age, income, education level, race, and gender. Most important was the measure of community integration; this was measured by asking participants to name at most 10 people who they interact with regularly. Through the use of multivariate OLS regressions, I find that community integration is positively associated with pro-environmental behaviors net of prior pro-environmental behaviors, age, community impact, and religion. I also find that age exhibits a marginally significant negative association with pro-environmental attitudes. Thereby this thesis provides initial evidence for the pro-environmental nature of tiny house communities as a result of community integration. While community integration was found to be a key predictor pro-environmental behavior, the same could not be said for the pro-environmental attitudes. Furthermore, community attachment did not exhibit any significant associations with behaviors or attitudes.

ACKNOWLEDGEMENTS

I would like to acknowledge Anthony Roberts, Patrick Mahoney, and Philip Cafaro for providing feedback on early drafts of the manuscript. I would also like to acknowledge the Institute for Research in the Social Sciences at Colorado State University for their help and feedback in testing the network survey used in this study.

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CHAPTER 1: INTRODUCTION

The last decade of life on earth has been the hottest ever recorded, with the last five years having been recorded as the hottest since recording began (Milman 2020). Global temperature increases have reached jaw dropping levels due to both the industrial revolution and more recently economic globalization starting in the 1970's. This rise in global temperature and the ever increasing greenhouse gas emissions has led experts to call for drastic changes, even going so far as put a death sentence on the planet, such that if we do not take substantive action in the next 10 years we are in 'runaway' global warming territory; a point of no return (Neslen 2018). These dire circumstances have resulted in a plethora of proposed solutions ranging from increasing efficiency, investing in renewable energy, creating institutional carbon taxes, to making individual lifestyle changes.

In an annual review piece titled "Climate Change and Society", Dietz and Colleagues explicitly question "[w]hat are the possibilities for reducing risk through reform and the potential for accomplishing more substantial societal transformation towards sustainability?" (Dietz, Shwom, and Whitley 2020:150). While potential answers to Dietz's question are aplenty, one such solution that has taken hold in the last decade is the tiny house movement and more specifically tiny house communities. Adherents of the tiny house lifestyle often embody an environmental ethic couched under auspices of minimalism, living with less, and simple living. While most of the tiny house movement literature has centered on tiny houses as a solution to the problem of homelessness, this thesis argues that tiny houses, but more importantly tiny house communities can also help solve the problem of global warming. Thereby this thesis also offers up tiny house communities as one potential way to push for "substantial societal transformation towards sustainability" as in the words of Dietz and colleagues (Dietz et al. 2020). Furthermore, this thesis

explores the question of how living in a tiny house community may impact members' pro-environmental behaviors and attitudes. I also question the role of community integration and place attachment in these kinds of behaviors and attitudes. This is due to the fact that community integration and place attachment have been severely understudied within the realm of the tiny house movement as well as the cohousing movement. Moreover, this thesis also provides evidence for how community integration and community attachment act as mechanisms that foster pro-environmental attitudes and behaviors of tiny house community residents. Thus, also providing potential insights into the same phenomenon within the realm of cohousing. Combining insights from community development, the cohousing movement, and environmentalism it is argued that tiny house communities cultivate individual pro-environmental behaviors and attitudes through fostering community integration and place attachment. Henceforth, while tiny house enthusiasts may initially exhibit high levels of pro-environmental behaviors and attitudes prior to joining a community, these behaviors and attitudes are further strengthened due to high levels of social integration. It is believed that members being surrounded by others with high levels of pro-environmental behaviors and attitudes creates a synergistic effect raising surrounding member's own pro-environmental behaviors and attitudes.

Furthermore, it is also argued that tiny house communities should be seen as an American rebirth of the chousing movement through a third wave. Tiny house communities are a formidable solution to the issue of climate change as they take on this issue through a multipronged approach through focusing on both community development and environmentalism. In addition, the thesis contributes important findings to the literature on intentional communities, community development, and social capital in the form of community integration in that it presents a new solution to the issue of climate change, one that is potentially financially feasible and has the

possibility to gain widespread adoption if given the chance. More broadly the thesis findings further add to our understanding of social capital's role in facilitating pro-environmental behaviors and attitudes. The findings also illuminate new insight into how intentional communities such as cohousing and tiny house communities foster pro-environmental behaviors and attitudes. To conclude this section, I provide a brief overview of the main research questions and chapters ahead.

Environmentalism in Tiny House Communities?

The tiny house movement is a rather recent social phenomenon only truly gaining traction after the great recession of 2008 and the creation of the first tiny house manufacturer Tumbleweed Tiny Houses by Jay Shafer (Mangold and Zschau 2019). The majority of the literature on the tiny house movement has come in the form of theses and dissertations which focus primarily on understanding the motivations behind why people 'go tiny' (Boeckermann, Kaczynski, and King 2019; Mutter 2013; Summers 2021). This focus on motivations is amplified by online blogs and groups on social media (e.g., www.tinyhouseblog.com, www.thetinylife.com, [reddit/TinyHouses](https://reddit.com/TinyHouses)). Motivations of tiny house enthusiasts tend to focus on following mantras of 'living with less', 'living debt free', and most pertinent, reducing one's impact on the planet. This often comes in the form of tiny house enthusiasts' interest in environmentalism couched within themes of simple living and environmental sustainability (Boeckermann et al. 2019; Böllert 2019; Mangold and Zschau 2019; Mutter 2013; Ritzer 2003; Saxton 2019; Summers 2021). While environmental considerations are often cited as reasons for 'going tiny', little to no research has explored how these environmental considerations play out within tiny house communities, and more importantly whether they are amplified in this context. The literature is therefore sorely missing any discussion of the potentially pro-environmental nature of tiny house communities around the US and the world. This is surprising given that tiny houses themselves have been shown to exhibit a lower

carbon footprint and utilize less resources to heat and cool (Carlin 2014; Crawford and Stephan 2020; Mukhopadhyay 2020). Therefore, it makes sense to view a community of tiny houses as a sustainable housing solution to the climate crisis. In addition to the paucity of research into tiny house communities as a sustainable housing option or else, little if any research has addressed the role of community integration and place attachment within these communities. While a gap exists in the tiny house movement literature specifically regarding environmentalism within tiny house communities, looking to the related movement of cohousing can provide some insights. Cohousing provides a good scaffold, in addition, some of its practices and beliefs are already prevalent in online tiny house resources and blogs (Mok 2018; Stephens 2017; Walker 2019). A brief overview of cohousing makes this point more salient.

The Emergence of Tiny House Communities: The Contemporary Cohousing Movement in the U.S.

Over the years the Cohousing Movement has gone through a metamorphosis in the form of 3 ‘waves. The initial wave was seen as an outgrowth of the feminist, utopian, and communitarian movements of 1960’s Denmark fueled by attempts to radically reimagine how people might live in community. This meant placing a strong focus on shared housework to help address women’s exclusion in the workforce (Sargisson 2012; Williams 2005). Cohousing later expanded beyond tenets of equality and shared responsibility to integrate beliefs in sustainable development, often embodied in second and third wave cohousing. The 1980’s saw the emergence of second wave cohousing within the United States which sought to reimagine the movement with more of an “environmental focus”, also seen as the result of “[a]mericans need for community, social support, interaction and security in their local neighborhood” (Sargisson 2012; Williams 2005:151). Second wave cohousing is primarily traced to the publication of Katherine McCamant and Charles Durrett’s, *Cohousing: A Contemporary Approach to Housing Ourselves* (Sargisson 2012). This

environmental focus has been documented in cohousing communities within North America (Sargisson 2012). Furthermore, it has been found that cohousing communities exhibit both a lower carbon and environmental footprint (Daly 2017).

Scholars have also turned to analyzing the environmental attitudes and behaviors of cohousing residents. In doing so they find that cohousing communities act as a “physical, instrumental, and social context within which pro-environmental attitudes and behavior are nurtured and sustained” (Meltzer 2000:129). Cohousers’ increased pro-environmental attitudes and behaviors could be attributed to the movements focus on residents fostering a connection to the land by living on it, becoming aware of their impact on the land, as well as engaging in their community gardens (Sargisson 2012). Thereby it can be said that cohousing communities are more environmentally sustainable and are successful in facilitating residents’ pro-environmental attitudes and behaviors (Tummers 2015). While it has been demonstrated that cohousing communities follow tenets of sustainability and have been shown to be more sustainable than other communities, less is known about the mechanism which leads them to foster beliefs in environmentalism and more specifically how these beliefs held within communities transfers to residents. There is some reason to believe that community integration and community attachment in the form of social contact design and mission statements within cohousing communities may play a role in fostering pro-environmental behavior attitudes, further research is required to tease out this issue; the pro-environmental nature of cohousing is discussed further within the literature review. This point of contention within cohousing parallels that of tiny house communities, such that while it is known that environmentalism is important to tiny house enthusiasts, less is known about the role of tiny house communities in fostering resident’s environmentalism.

To reiterate, while there appears to be plenty of literature on the motivations as to why people join the tiny house movement, what is sorely missing is a discussion of how living in tiny house communities affects members pro-environmental attitudes and behaviors. The literature has shown in multiple instances the importance of pro-environmental behaviors and attitudes, but none of the literature has specifically engaged in measuring these types of behaviors and attitudes and more specifically what factors influence these behaviors and attitudes such as community integration and community attachment. Furthermore, none of the literature has looked at the role of tiny house communities in promoting these behaviors and attitudes. Looking to cohousing provides a roadmap for how to both study and explain why an intentional community like a tiny house community would nurture pro-environmental behaviors and attitudes. Not only that but tiny house communities can also be appropriately viewed as an American rebirth of the cohousing movement. It is therefore the aim of this paper to address the following research questions:

Q1. How does living in a tiny house community affect pro-environmental attitudes and behaviors?

Q2. What is the role of community integration in increasing pro-environmental attitudes and behaviors among tiny house community members?

Q3. What is the role of community attachment in increasing pro-environmental attitudes and behaviors among tiny house community members?

Social Integration, Place Attachment, & Environmentalism in Tiny House Communities

This study argues that the proliferation of tiny houses and tiny house communities are a modern rebirth of 3rd wave cohousing within the United States. According to Willoughby, Mangold, and Zschau (2020) a tiny house enthusiast is “an individual who (1) has made a concerted effort to learn about the tiny house lifestyle, (2) currently lives in a tiny house, or (3) is in the planning, building, or buying stage of a tiny house” (p. 6). Equally important is what is referred to as a tiny house, which while the specifics of this remains disputed by many (Mangold

and Zschau 2019; Mutter 2013; Olsson 2020; Shearer 2019; Shearer and Burton 2018), this study defines a tiny house as a house often less than 500 square feet in size located either on a foundation or wheels (for a typology on tiny houses see Shearer and Burton 2018). Relatedly, tiny house communities are seen to be a neighborhood style grouping of housing structures comprised of primarily tiny houses on wheels or a foundation that may also include mixed developments such as RV's, Park Model Homes, trailers, and micro-homes with varying purposes ranging from long term rentals, vacation resorts, to communities for homeless individuals (Evans 2020; Jackson et al. 2020; Mingoya 2015).

In addition, it is also argued that the tiny house movement and more importantly, tiny house communities embody ideas of environmentalism in the form of pro-environmental attitudes and behaviors. The term pro-environmental behaviors is often used interchangeably with environmentally responsible behaviors as well as ecological behaviors (Jin 2013). Pro-environmental behaviors generally refer to a set of behaviors that have the intention of positively impacting the natural environment through combatting problematic lifestyle tenets (Cook and Berrenberg 1981; Jin 2013; Lipsey 1977; Stern 2000). Pro-environmental attitudes follow the same logic but relates to attitudes on the environment. Pro-environmental attitudes are viewed “as concern for the environment or caring about environmental issues” (Gifford and Sussman 2012:2). The linkage and often cited gap between pro-environmental behaviors and attitudes will also be discussed in the literature review section.

Furthermore, using insights from cohousing it is argued that community members' degree of community integration into their tiny house community plays a key role in residents' levels of pro-environmental attitudes and behaviors. In this study community integration is defined through social capital. Social capital has a rich and diverse history spanning the fields of psychology,

economics, sociology etc. Most often cited has been the work of Pierre Bourdieu, James Coleman, and Robert Putnam. Each conceptualizes social capital slightly differently from Bourdieu's relational form to Coleman's more functional approach to the deeply global and civic oriented focus with Putnam. Social capital and its various conceptualizations are described in further detail in chapter 2. This study views community integration through the lens of a relational, network based approach form of social capital. Most importantly it specifically focuses on viewing social capital as the density of network ties within a community that each individual has. Thus, it is theorized that the more centrally integrated into a community an individual is the higher their levels of pro-environmental attitudes and behaviors are. This can be attributed to a potential synergistic effect that occurs due to residents being surrounded by others who already hold high levels of pro-environmental behaviors and attitudes.

It is further argued that while place attachment does not exhibit a statistically significant role in fostering pro-environmental behaviors and attitudes it still plays a pivotal role in fostering the pro-environmental behaviors and attitudes of people living in tiny house communities. It is theorized that individuals who feel attached to their community and more broadly the natural world will feel more compelled to hold pro-environmental attitudes and engage in more pro-environmental behaviors. Like social capital, attachment has also been heavily theorized in many different fields. Place attachment is a complex phenomenon often connected to a *sense of place* as well as *place meaning* (Van Patten and Williams 2008). In this study, place attachment refers to the “emotional —usually positive— bond between a person and setting” in this case the bond between a person and their respective tiny house community (Brehm, Eisenhauer, and Stedman 2013:523).

Thesis Overview

Chapter 2 synthesizes literature on the tiny house movement and tiny house communities and finds that the literature is primarily comprised of studies on the motivations as to why people ‘go tiny’ or on how tiny house communities are being used to ameliorate homelessness. Chapter 2 also reviews the history of the cohousing movement and finds that cohousing embodies an environmental focus in a later third wave. In doing so, similarities between cohousing and tiny housing are also discussed. Past conceptions and current findings on social capital as a key player in individual pro-environmental attitudes and behaviors are also discussed. In addition, I present how place attachment can play a role in facilitating pro-environmental attitudes and behaviors. Chapter 3 discusses the underlying methodology behind the collection and administration of both the Network and Motivation survey as this study utilizes 2 samples. Chapter 3 also reviews the analytical strategies used such as descriptive statistics, bivariate analysis, and multivariate OLS regression. Descriptive statistics were used on both samples to assist in developing a tiny house enthusiast demographic profile, while bivariate statistics were only used on the network survey to identify key covariates to include in the more complex multivariate OLS regression. Analytical strategies within chapter 3 are followed by an overview of some diagnostics, which included testing for univariate and multivariate outliers, multicollinearity, and heteroskedasticity through the use of a robust regression. Chapter 4 analyzes both the network and motivations surveys used in this study to present a demographic profile of the average tiny house enthusiast which consists of a white, college educated, middle aged woman who makes an annual household income of \$62,500. Chapter 4 also reviews the primary motivations, importance of specific behaviors, and the philosophical influences behind people’s choice to ‘go tiny’ such as financial security, freedom & autonomy, meaningful relationships, new experiences, as well as simple living which includes

an interest in environmentalism. Tiny house enthusiasts' philosophical influences stem primarily from minimalism, voluntary simplicity, environmentalism, and anti-consumerism. Chapter 5 describes the research hypotheses as well as how the main independent variables (community centrality, Christian, community impact, age, community attachment) and dependent variables (pro-environmental behaviors and attitudes) were measured in the study. Most importantly, chapter 5 presents the results from the multivariate OLS regressions, such that pro-environmental behaviors are found to be significantly predicted by community centrality, Christian, age, and community impact and pro-environmental attitudes is only slightly predicted by age; interaction effects, and robustness checks are also discussed. Chapter 6 concludes this study by highlighting key findings and connecting them back to the broader literature at hand.

CHAPTER 2: LITERATURE REVIEW

The extant literature on the tiny house movement continues to lack studies investigating tiny house communities aside from as a solution to homelessness. I address this literature gap by conducting a study to investigate how tiny house communities may be able to help solve the problem of climate change. To do so I briefly discuss the role and evolution of the related cohousing movement, followed by a review of the environmentalist tenets often encapsulated within tiny house communities and the tiny house movement. Tiny house communities are then also presented as the third wave of cohousing within the US. Furthermore, in order to adequately address what might be driving environmentalism within these intentional communities, I also show how higher levels of social capital and place attachment have been shown to play a key role in participant levels of pro-environmental behaviors and attitudes.

While tiny house enthusiasts and tiny house communities have been shown to embody environmentalist tenets, it remains unclear how living in community affects people's pro-environmental attitudes and behaviors. It is also unclear whether findings on community integration and community attachment within cohousing transfer to tiny house communities.

The History of the Cohousing Movement

Table 1. Cohousing Movement Timeline

Time Period	Wave	Main Focus
Early 1960's - Late 1970's	1	<ul style="list-style-type: none">• Reimagining community• Greater shared household responsibility• Mostly limited to northern European countries
Early 1980's - mid 2000's	2	<ul style="list-style-type: none">• Include more environmental focus• Utilizes multitude of development tactics• Viewed as primarily US based
Late 2000's - Present	3	<ul style="list-style-type: none">• Reimagining of 'tiny' community living• Small/tiny housing with deep interest in environmentalism• Reduction of debt, fostering meaningful relationships and creating new experiences

The Cohousing movement has been viewed primarily as an outgrowth of the feminist, utopian, and communitarian movements of 1960's Denmark. Throughout its long life, cohousing has evolved, passing through what is referred to in the literature as three main 'waves'. Each wave exhibits slightly different tenets and beliefs. Cohousing communities "can be identified by six common characteristics: (1) participatory process, (2) design that facilitate community, (3) extensive common facilities, (4) complete residential management, (5) non-hierarchical structure and (6) separate income sources" (Jakobsen and Larsen 2019:416; McCamant and Durrett 2011). These characteristics become important when comparing cohousing to tiny house communities. Cohousing communities have the "chief goal to create a rich social environment with enhanced mutual support", often through using the community common house (Sanguinetti 2014:86).

First wave cohousing emphasized radically reimagining how people might live in community by placing a strong focus on shared housework in the hopes of the addressing the women's exclusion in the workforce (Sargisson 2012; Williams 2005). Themes of female empowerment and shared housework were evident in that at the time cohousing aimed to bring community members closer to one another to help "break the isolation of the nuclear family, singles, and children" (Horelli and Vespä 1994:210). The goal, in this case, was to establish community-driven childcare to alleviate a burden historically bound to women. Wave one was limited to mostly northern European countries which included countries such as Denmark, Sweden, and the Netherlands (Meltzer 2000; Williams 2005). This initial wave also gained mainstream popularity within Europe and began to be implemented in the form top down and grass roots approaches (Williams 2005). Cohousing later expanded beyond its tenets of greater equality and shared responsibility to integrate a belief in sustainable development.

Second wave cohousing has primarily been traced to the United States in which previous tenets of the movement were reimagined to include a more “environmental focus”, something that was also seen as the result of “[a]mericans need for community, social support, interaction and security in their local neighborhood” (Sargisson 2012; Williams 2005:151). Second wave cohousing has also been heavily linked to the publication of Katherine McCamant and Charles Durrett’s 1988 book, *Cohousing: A Contemporary Approach to Housing Ourselves* (Sargisson 2012). Important however, is that second wave cohousing within the US strictly deviates any form of collective governance away from what could be termed a commune like environment (Jarvis 2015). Interestingly enough, this second wave has also been purported by some to exhibit some degree of utopian tendencies echoing the foundations of 1st wave cohousing, something routinely denied by influential individuals within the cohousing sphere (Sargisson 2012). Second wave cohousing also moved towards adopting a larger number of development tactics which include “develop-led, partnership, resident-led, new and retrofit approaches” (Williams 2005:202).

In its most recent iteration, a third wave of cohousing has come to fruition in the Pacific Rim which places a focus on “green architecture” as well as issues of affordability and movement accessibility (Jarvis 2015; Williams 2005). This wave is less discussed in the literature and has been described by some to be occurring simultaneously alongside second wave cohousing (Jarvis 2015). This thesis aims to offer some clarity in this issue by painting the proliferation of tiny house communities as the modern third wave of cohousing within the US. Overall, it can be said that cohousing’s social, environmental, and economics benefits make this form of intentional community one that is both more sustainable and promising for countries and governments who are in pursuit of fulfilling their promises on sustainability targets. The environmental sustainability aspects of cohousing communities are discussed in further in the following section.

Contemporary Cohousing in the U.S.: The Tiny House Movement

The mainstream tiny house movement (THM) was born out of the great recession of 2008. People flocked to the tiny house movement as an alternative lifestyle in pursuit of the ‘good life’ often embodied within tenets of financial freedom, downsizing, minimalist living, and an interest in living more sustainably (Boeckermann et al. 2019; Mangold and Zschau 2019; Saxton 2019; Summers 2021; Willoughby et al. 2020). The THM was also seen as a response to American hyper-consumerist culture often embodied through a drive to live with only the essentials and a fight to eliminate debt. According to some, the THM also gained philosophical inspiration from the likes of Thoreau’s transcendentalism and other lifestyle and philosophical movements such as voluntary simplicity and minimalism (Anson 2017, 2018; Ford and Gomez-Lanier 2017; Harris 2018). Interests in reducing debt, and living with less put aside, tiny house enthusiasts also placed strong focus on environmentalist reasons for going tiny (Ford and Gomez-Lanier 2017; Kilman 2016; Saxton 2019; Summers 2021; Vannini and Taggart 2013). It has been suggested that living tiny comes with a host of environmental benefits such as a reduced carbon footprint (Carlin 2014; Crawford and Stephan 2020; Ford and Gomez-Lanier 2017; Shearer 2019). Elsewhere it has also been suggested that tiny house enthusiasts are also deeply interested in fostering a ‘sense of community’ through their interest in living in community with other tiny house enthusiasts (Willoughby et al. 2020). Tiny house enthusiasts’ interest in community living has also been seen as a potential outgrowth of an interest in meaningful relationships and social connection (Harris 2018; Mangold and Zschau 2019). Tiny house enthusiasts’ interest in community living is further evidenced by the proliferation of tiny house communities. According to searchtinyhousevillage.com there are a total of 33 registered tiny home communities comprised of only tiny houses registered in the US; up to date, accurate numbers on the quantity of tiny house

communities remain hard to pinpoint (Anon 2020). In addition, there has also been a proliferation of research into how tiny house communities might be used as a solution to the problem of homelessness (Evans 2020; Jackson et al. 2020; Mingoya 2015) and equitable housing (Kozlowski 2020). Nonetheless, there remains a paucity of research looking into the pro-environmental aspects of living in a tiny house community.

Using findings from the cohousing it is clear that tiny house communities could be viewed as an American rebirth of cohousing, specifically a 3rd wave of cohousing. Little if any literature has touched on 3rd wave cohousing aside from pointing to the wave's focus on issues of sustainability and accessibility. It is therefore important to illustrate the similarities and subtle differences between cohousing and tiny house communities. Prior to doing this it is important to briefly review how tiny house communities should be considered as a form of intentional community. According to Meijering, Huigen, and Hoven (2007), intentional communities generally have the following characteristics: "1. No bonds by familial relationships only. 2. A minimum of three to five adult members. 3. Members join voluntarily. 4. Geographical and psychological separation from mainstream society. 5. A common ideology that is adhered to by all members. 6. Sharing of (a part of) one's property. 7. The interest of the group prevails over individual interests." (42). The nature of an intentional community is most clearly seen with cohousing using the above characteristics. Many, if not all of the intentional community characteristics can be applied to tiny house communities. All of the sampled tiny house communities adhere to the majority of the criteria above aside from characteristic 4 and 7. It is however unclear what proportion of tiny house enthusiasts live in a community. While many tiny house communities might be geographically separated, they are not necessarily psychologically separated from the rest of society, they do however share a common ideology whether it is to live

sustainably, minimally, or simply ‘tiny’. Characteristic 7 may not be true for all communities as many of these communities appear to still follow the tenets of American individualism. Nonetheless it would be wise to include tiny house communities within the realm of intentional communities.

Tiny house enthusiasts are increasingly becoming exposed to ideas of cohousing and alternative forms of community style living through online media (Boeckermann et al. 2019; Harris 2018; Willoughby et al. 2020). Earlier research shows that tiny house enthusiasts draw their communal inspirations from the web as a result of the movement’s strong following on social media, and online blogs (Hutchinson 2016). Tiny house enthusiasts are increasingly look to sites such as tinyhouseblog.com, tinyhouseexpedition.com, as well tinyhousecommunity.com to learn about communal living, providing some of the inspiration for cohousing-esque nature of tiny house communities (Stephens 2019; Walker 2019). For example, tinyhousecommunity.com explicitly references cohousing specific resources on community development, therefore potentially a key site of inspiration for the developers of tiny house communities. Some have even referred to these online resources as a “virtual mecca for individuals interested in joining or starting their own TH [tiny house] communities” (Willoughby et al. 2020:23). These kinds of influences from cohousing and other intentional communities are also oftentimes furthered through both workshops and festivals celebrating the tiny house movement (Kanto 2019; Microlife Institute 2019). Preliminary findings presented similarities between cohousing and tiny house communities which provides some evidence to support the claim that tiny house communities and the larger tiny house movement could be viewed as a kind of American Rebirth of the cohousing movement.

As discussed early on, cohousing can facilitate pro-environmental attitudes and behavior due to a symbiotic relationship with social capital. In addition to the influence of online cohousing

resources on the design of tiny house communities, the tiny house movement and more importantly tiny house communities also appear to share similarities with cohousing in regard to sustainability. There remains a dearth of academic literature on tiny house communities and their role in facilitating pro-environmental behaviors and attitudes, albeit tiny house enthusiasts’ interest in environmentalism. This is often described as simple living or interest in environmentalism by others within the tiny house literature (Boeckermann et al. 2019; Mangold and Zschau 2019; Mutter 2013; Saxton 2019; Summers 2021). Environmental sustainability has been implicated as one of the main reasons that some tiny house enthusiasts choose to embrace the lifestyle (Mangold and Zschau 2019; Saxton 2019; Summers 2021). Tiny house community mission statements often echo similar environmentalist sentiments. Mission statements provide an inside look at what the community is centered around, which for some, entails an increased focus on environmentalism. Table 2 provides excerpts from some tiny house community websites demonstrating their explicit focus on environmentalism. It is therefore possible to infer that since tiny house enthusiasts appear to be environmentally minded this would transfer to tiny house communities. From Table 2 it is also clear that some tiny house communities directly embed environmentalist rhetoric into their websites in advertising their community.

Table 2. Environmentalism within Tiny House Communities

Community	Environmentalism Themes within Tiny House Communities
LuxTiny	<i>“Our community focus is to become a Green Community here in the White Mountains all while providing an affordable Primary Residence or Vacation Home...Greenhouses, solar panels, chicken coops, and any other green aspects are more than welcome in our community. We hope that a few of our cabins will be net zero!”</i>
Village Farm	<i>“Imagine living in a tiny home that automatically cuts your water consumption in half, lowers your utility bills, beautifies the neighborhood, and creates sanctuary for local wildlife. When you call Village Farm home, that’s what you can expect. Embracing simple living fosters a sense of joy and contentment for many and Village Farm is the perfect community to connect with like-minded individuals.”</i>
The Meadows	<i>“When Simple Life began conceptualizing a new kind of housing choice, our passions were partly fueled by the modern tiny house movement and the growing demand for smaller, more efficient living.”</i>

Building off of the environmental focus of tiny house communities, another similarity with cohousing communities is based on the physical layout of these communities. While tiny house communities do not explicitly state or mention the use of a cohousing type social contact design approach to the design of the community layout, it is clear that tiny house communities (THC) borrow ideas from this approach in the overall design of their communities. This can be seen in



Figure 1a. Typical Cohousing Community Layout

the way that the houses are laid out. While some THCs do follow the SCD approach in placing buildings facing one another and include intersecting walkways, they have tended to follow the layout of more traditional American subdivisions. Figure 1a provides an example of a typical cohousing community layout. Notice how the front of houses are oriented toward other houses, roads are on the outskirts, with intersecting walkways, and a common house. Figure 1b is an example of a large-tiny house community, notice how the community has common facilities, some non-intersecting walkways, and has roads within the community. It should also be noted that some tiny house communities also have shared amenities such as a pool, laundry facilities, as well as community gardens. From this example it can be seen that while both communities share similarities, THCs tend to still follow more of a traditional subdivision format.

It should be stated that the THC in Figure 1b hosts events at the common house and also allows visitors as well as new home buyers to tour the community. Continued reliance on more traditional subdivision design within tiny house communities echoes how this cohousing rebirth has a specific



Figure 1b. Large Tiny House Community Layout

America twist to it. At the same time, THC's continue to push the narrative of building a close knit community of residents furthering echoing the importance of a social contact design approach. Implementation of social contact design principles within tiny house communities is further evidence through the use of community gardens, amenities, and in some cases a common house. Use of SCD also continues to be furthered through the use of cohousing community design principles on tiny house resource websites (Stehphens 2017).

Another point of comparison that provides further evidence of THC's as a 3rd wave of cohousing has to do with the similarity in the demographics of movement adherents. Literature

has shown cohousing to be open and inclusionary with respect to age, religion, and household types; cohousing however remains exclusionary in terms “of affluence, social class, race, education and attitudes” (Williams 2005:201). This exclusionary aspect is not to be confused with the idea that different groups of people are systematically excluded, but rather that only a certain demographic has taken up cohousing based on the data available. This might not be surprising when one considers how cohousing spawned from the primarily white country of Denmark (Sargisson 2012; Williams 2005). It is however a bit surprising given the feminist roots of the cohousing movement. The lack of diversity is echoed by Melter (2000), whose study on 18 cohousing communities finds that “the vast majority ... are of European descent (95%) ...[and] have a university education (80%)” (121). This deficit extends to age, as according to one systematic review of the cohousing literature points to a domination of samples primarily comprised of seniors (Lang, Carriou, and Czischke 2020). From the available literature on the tiny house movement, parallels begin to appear in regard to demographics. From the little existing literature, we find that tiny house enthusiasts align with cohousers in that they are primarily white, college educated, and middle class (Boeckermann et al. 2019; Mangold and Zschau 2019; Saxton 2019; Summers 2021; Willoughby et al. 2020). Boeckermann (2019) finds that almost 97% of her sample participants were white and nearly 60% of them were college educated and earned a middle-class income. Findings from this study presented within Chapter 4 also confirm this homogeneity of demographics and somewhat exclusive nature of the tiny house movement and their respective communities. Furthermore, similarities among demographics illustrates the deeply similar nature of tiny house enthusiasts and their cohousing counterparts, they can in a sense be considered to be ‘cut from the same cloth’. In addition, while cohousing and tiny housing enthusiasts may come from a limited background and do not echo sociodemographic diversity,

both should be considered diverse in terms of their attitudes and thoughts about how to live as they rub against many of the traditional values of American society.

With its move to the US in the late 1980's Cohousing gained an environmental focus and has spurred development of these communities in recent decades (Sargisson 2012; Williams 2005). This focus on environmental sustainability has been supported by more recent research such as that of Sargisson (2012) who studied 50 cohousing communities and found that residents exhibited strong concern for the environment. This is evidenced by participant concern over conservation and environmental sustainability, it was however also shown that these concerns follow alongside a "pragmatic 'shallow' or 'light green' environmentalism" (Sargisson 2012:45). Light green environmentalism primarily refers to protecting the environment largely through individual responsibility. However, some still view cohousing as a good candidate in which to "investigate environmental attitudes and behaviors within a bounded and integrated socio-physical context" (Meltzer 2000:111). This has spawned numerous studies into whether cohousing communities are in fact more sustainable than traditional neighborhoods (Sanguinetti 2014). It has been found that cohousing communities do in fact exhibit both a lower carbon and environmental footprint (Daly 2017). Some scholars have even come to view cohousing communities as a "physical, instrumental, and [a] social context within which pro-environmental attitudes and behavior and nurtured and sustained" (Meltzer 2000:129). Furthermore, this nurturing of pro-environmental attitudes and behaviors could be attributed to the movements focus on residents fostering a connection to the land by living on it, becoming aware of their impact on the land, as well as engaging in their community gardens (Sargisson 2012). Similarly, Sanguinetti (2014) points to how this enhanced connection to both nature as well as the community should lead to an increase pro-environmental behavior.

It has been demonstrated that cohousing communities are to some degree more environmentally sustainable both through sustainable building practices and also through members already holding higher levels of pro-environmental attitudes and behaviors. An equally important component to discuss is how the use of social contact design (SCD) within these communities facilitates and nurtures pro-environmental behaviors and attitudes. SCD implies creating intersecting walking paths and shared living facilities with the aim of increasing social interaction leading to denser social support networks (Williams 2005). SCD is one of the key mechanisms of social capital creation in the community. SCD increases the chance of residents meeting one another and forming relationships as a byproduct of the community's physical layout, potentially leading to increased social capital. Social capital then becomes an important factor in facilitating the pro-environmental behaviors and attitudes within these communities. It has been shown that possessing social capital within a cohousing community also increases the likelihood of holding pro-environmental attitudes and engaging in pro-environmental behaviors (Meltzer 2000). It has been specifically implicated that high levels of social capital are deeply influential on pro-environmental behaviors (Pretty and Ward 2001). While cohousing enthusiasts oftentimes already embody environmentally responsible behaviors, social capital appears to further the embodiment of pro-environmental behaviors and attitudes (Daly 2017; Lang et al. 2020; Meltzer 2000; Williams 2005). Social capital thereby plays an important role in the manifestation of pro-environmental behaviors and attitudes within intentional communities such as cohousing and potentially even tiny house communities. Further implications of social capital are also discussed later in the literature review. Thereby it can be said that cohousing communities are more environmentally sustainable and are successful in facilitating residents' pro-environmental

attitudes and behaviors, by fostering social cohesion and community resilience (Chatterton 2013; Jarvis 2011; Sargisson 2012; Tummers 2015; Tummers and MacGregor 2019).

Community Integration & Environmentalism: Social Capital, Attachment, and Pro-Environmental Behavior and Attitudes

Social capital, referred to as community integration within this study, has a rich history of research and conceptualization, drawing substance from a multitude of disciplines such as economics, psychology, and sociology. Social capital has been defined in a number of ways over the years, most famously by Pierre Bourdieu, but also by the likes of James Coleman, and most prominently, Robert Putnam. Bourdieu views social capital through more of a relational lens as opposed to Coleman who views social capital as holding a specific function and Putnam who focuses more on the macro level by centering on civics (Bourdieu 1983; Coleman 1988; Putnam 2000). While Bourdieu is often cited as the originator of social capital, he has also received criticism due to measurement difficulty and a lack conceptual coherence (Prell 2006). Coleman suffers a similar fate in that while viewing social capital as purely functional might be helpful in understanding social capital's utility it can also be severely limiting as social capital serves as much more than a function. Coleman is however credited with providing the concept widespread visibility within sociology and moves toward viewing dense networks as being necessary for social capital to emerge (Portes 1998). In addition, while Putnam is widely cited, his approach also falls short in that he assumes that community aggregates might be able to take the place of "emergent qualities" within social capital (Prell 2006). While each have shortcomings, they do however provide insight into how social capital can be conceptualized and operationalized. Putnam has been noted to point out that "social networks have value" and thereby social capital (Kadushin 2012:162). More specifically, "social networks have value because they allow access to resources and valued social attributes such as trust, reciprocity, and community values" (Kadushin

2012:162). In addition, according to a review of social networks by Charles Kadushin, social networks are both a measure of social capital and also the “process that leads to social capital” (2012:177). Thereby the conceptualization of social capital in this thesis draws partly on Putnam due to his placing of importance on social networks, norms surrounding reciprocity as well as the issue of trust (Prell 2006; Putnam 2000). I refer to social capital as community integration in this study and is therefore important to look at social capital in a more network based modality.

Bourdieu, Coleman, and Putnam provide a good background as to how social capital has been conceived of, but in order to move towards a more relational and network based approach, I look towards Nan Lin’s work in this regard. Seemingly inspired by the likes of the big three, Lin views social capital as “resources embedded in one’s social networks, resources that can be accessed or mobilized through ties in the networks” (Lin 2002, 2008:4). This is important as it has been widely agreed upon that social capital is network-based (Bourdieu 1983, 1990; Burt 1992; Coleman 1988; Erickson 1996; Putnam 2000). While it is understood that social capital is network-based, Lin is clear to point out that social capital and social networks are themselves not interchangeable, but much like the big three, social networks are seen to be what makes access to social capital possible (Lin 2008). In the case of tiny house communities this would mean that community social networks enable the sharing of knowledge and resources on pro-environmental attitudes and behaviors. Clearly influenced by prior theorists, Lin (2008) provides what he terms as “three principal sources” of social capital namely, (1) a social actors structural position, (2) network locations, and (3) purposes of action. Defining social capital this way provides much utility in studying intentional communities such as cohousing and tiny house communities such that it makes it possible to specifically investigate specifically how social networks enable social capital and then impact the holding of pro-environmental attitudes and furthermore, the

engagement of pro-environmental behaviors. Social capital measured this way has most often been done through the use of name generators such as the one used in this study (Giuffre 2013; Lin 2008; Rainie and Wellman 2012).

Social capital has been found to be highly important in people's engagement of pro-environmental attitudes and behaviors. People with more social capital in terms of the number of relational ties leads to folks being exposed to a wider gamut of views and information, which therefore could also lead to being exposed to pro-environmental behaviors and attitudes (Granovetter 1973). Macias and Nelson (2011) further confirm the strength of weak ties presented by Granovetter (1973) in finding a significant effect between the number of weak ties a person has and their level of environmental concern. Macias and Nelson also found that people exhibiting close ties to neighbors are potentially exposed to a broader set of environmental perspectives that have the potential to fundamentally challenge "past habits, lifestyles, or stereotypes" (Macias and Nelson 2011). A recent study also demonstrated support for this assertion in that pro-environmental behaviors were found to be positively connected to participants interacting with others who are dissimilar to themselves (Geerts, Vandermoere, and Oosterlynck 2020). These studies therefore provide support for the strength of weak ties thesis presented by Granovetter in that loose or weak network ties have great potential in influencing the behaviors and attitudes of others; this also extends to access to resources. It has also been found that resident's community networks have a direct impact on resident's intentions of engaging pro-environmental behaviors, regardless of whether their community holds high or low social capital (Cho and Kang 2016). Social capital has also been found to reduce the proverbial wedge between pro-environmental outcomes and attitudes within specific contexts such as social evenings with neighbors. Macias and Williams posit that exchanges between neighbors during these social evenings provide "some

of the best sources of learning about water catchment systems for gardening ... and other environmentally friendly practices” (Macias and Williams 2014:409). Another study found that individuals with higher levels of social capital are more inclined towards taking behavioral action to reduce the impact of climate change and also exhibit increased support for policy related to climate change (Hao, Liu, and Michaels 2020). Thus, it is theorized that the more centrally integrated into a community an individual is the higher their levels of pro-environmental attitudes and behaviors are. This can be attributed to a potential synergistic effect that occurs due to residents being surrounded by others who already hold high levels of pro-environmental behaviors and attitudes.

Similar to social capital, place attachment has also been heavily theorized in many different fields and is therefore a heavily contested topic. Place attachment is a complex phenomenon often connected to a *sense of place* as well as *place meaning* (Van Patten and Williams 2008). Place is therefore a core component of attachment with place studies often attributed to the work of geographers Tuan (1975, 1977) and Relph (1976). Tuan and Relph were also some of the first to take a more phenomenological route to place studies, an approach that focuses on taking a holistic approach to the study of place through using qualitative methodologies. The concept of attachment has oftentimes been connected to the field of psychology but has also been exhibited within the sociology in the form of community attachment, this caused some to note some inconsistency in use of the concept leading to equally inconsistent results across the literature (Daryanto and Song 2021; Trentelman 2009). Most importantly however, place attachment as a concept is used to investigate relationships “between people and both natural and built environments” (Trentelman 2009:200). Place attachment provides important background information for the more sociological form of attachment embodied within the concept of community attachment.

Community attachment gained notoriety around the same time as the work of Tuan and Relph. The concept gained widespread acceptance and use through the work of Kasarda and Janowitz in their 1974 piece aptly titled, “Community attachment in mass society” in which they developed a measure of community attachment. Community attachment was measured by asking participants about their “interest in the community”, whether they “feel at home”, and whether they would feel “sorry to leave” the community (Kasarda and Janowitz 1974; Ma 2020). This measure of community attachment is often used as “a measure of sentiment regarding the community one lives in and an indicator of one’s rootedness to one’s community” (Trentelman 2009:201). Community attachment thus provides much more utility in specifically investigating attachment within the context of an intentional community such as a tiny house community. Similar to place attachment, community attachment remains a poorly developed concept one with varying conceptualizations and operationalizations (Daryanto and Song 2021; Flaherty and Brown 2010; Gene L. Theodori 2000; Ma 2020). As a result, the majority of studies have focused on simply measuring community attachment and have strayed from clearly defining it, instead as stated above most often measuring it based on participants sentiments about their community (Ma 2020). Kasarda and Janowitz’s approach has been used and adapted over the years as a solid measure of community attachment, it is thereby also how I measure community attachment with some slight adjustments. Due to place attachment’s lack of conceptual clarity, this study adopts the use of a definition which generally covers the swath of literature on this topic. Attachment used in this study specifically refers to community attachment but operates off a general definition of attachment so as to refer to the “emotional —usually positive— bond between a person and setting” in this case the bond between a person and their respective tiny house community (Brehm

et al. 2013:523). More simply put, community attachment refers to an “emotional investment in place” (Hummon 1992).

The literature has shown there to be a positive relationship between attachment and both environmental concern and pro-environmental behaviors (Buta, Holland, and Kaplanidou 2014). A positive relationship has also been identified between sense of place and pro-environmental behavior (Walker and Chapman 2003). Manzo and Perkins (2006) also further the conclude that people tend to specifically protect places which provide meaning to their lives or in the words of Hummon, places in which people are emotionally invested. Relationships between place attachment and pro-environmental behaviors has most often been seen in relation to public parks and protected spaces (Buta et al. 2014; Halpenny 2010). Furthermore, in a recent meta-analysis it was found that overall place attachment tends to have a positive effect on pro-environmental behaviors, couching their findings by generally pointing to attachment as fostering feelings of belonging which can then lead to the promotion of civic activities that include environmentally responsible behaviors (Daryanto and Song 2021). Attachment has also been implicated as an important predictor of pro-environmental attitudes and intentions (Halpenny 2010; Pei 2019; Rokicka 2002).

In addition to community integration and place attachment a number of demographic indicators have also been shown to play a key role in predicting pro-environmental behaviors and attitudes, most often through the related concept of environmental concern. Age generally exhibits a negative relationship, with younger individual being more environmentally concerned (Brieger 2019; Franzen and Meyer 2010; Jorgenson and Givens 2014; VanHeuvelen and Summers 2019). Women also tend to be more environmentally concerned than their male counterparts (Combes, Hamit-Haggar, and Schwartz 2018; Davidson and Freudenburg 1996; Dzialo 2017; McCright and

Xiao 2014). Income has also been shown to be a key predictor of environmental concern, with some viewing environmentalists as being primarily middle or upper-middle class (Brieger 2019; Gelissen 2007; Gifford and Sussman 2012; Nawrotzki and Pampel 2013). Education level exhibits a positive relationship with environmental concern (Gifford and Nilsson 2014; Israel and Levinson 2004; Jorgenson et al. 2016; Nawrotzki 2012). The effect of religiosity is not as clear, but finds generally that fundamental Christians exhibit lower levels of environmental concern (Eckberg and Blocker 1989; Greeley 1993). There has also been a recent trend towards a 'green Christianity' indicating more pro-environmental attitudes, but not behaviors (Clements, McCright, and Xiao 2013). In terms of race, little difference in environmental concern was exhibited among whites and blacks (Mohai 2003). There is however some evidence to show that Hispanics are more likely to support increased spending on environmental regulations (Whittaker, Segura, and Bowler 2005). In addition, non-whites have higher rates of environmental risk perception which is explained by the fact that non-whites tend to be located in areas more likely to be exposed to environmental risks (Brown 1995; Mohai and Bryant 1992; Mohai, Pellow, and Roberts 2009; Ringquist 2005).

CHAPTER 3: DATA AND METHODOLOGY

To address the gap in the tiny house movement literature and more specifically tiny house communities this study uses two surveys to first illustrate the environmentalist nature of tiny house enthusiasts and then secondly, investigate how living in a tiny house community affects respondent's levels of pro-environmental attitudes and behaviors. To further investigate the effect of living in a tiny house community on pro-environmental behaviors and attitudes this study also investigates the role of community integration and place attachment. This approach allows me to answer the research questions, specifically by understanding how living in a THC effects respondents levels of pro-environmental behaviors and attitudes and also what roles that community integration and community attachment play. This study collected data on the tiny house population through the use of a network survey and a motivations survey. The network survey tested the hypotheses surrounding social capital, community attachment, and pro-environmental behaviors and attitudes. Hypotheses were tested using multivariate ordinal least squares OLS regressions on the primary dependent variables: pro-environmental behaviors and attitudes. Independent variables included in the behaviors and attitudes models were prior pro-environmental behaviors and attitudes, community centrality, age, Christianity, community impact, community attachment. The motivations sample served as a tool to generate a demographic profile of the average tiny house enthusiast. The demographic profile was created using descriptive statistics which measured the average age, household income, education level, gender, and race of a tiny house enthusiast. In addition to discussing the content, sample frame, and administration of both surveys, I also review the assumptions of multivariate OLS regression as well as the analytical diagnostics used such as testing for multicollinearity, heteroskedasticity, univariate and multivariate outliers, as well as basic correlational analysis.

Network Survey Sample

Content of the Network Survey

The network survey content was geared towards primarily 3 aims; (1) to understand how participants' pro-environmental attitudes and behaviors potentially change upon moving into a tiny house community, (2) to understand the importance of place attachment in participants' pro-environmental attitudes and behaviors, and (3) to understand the role of social capital in facilitating tiny house enthusiasts' pro-environmental attitudes and behaviors. While social capital is a broad concept with many competing conceptualizations and operationalizations, this study looks at social capital primarily through a network analysis perspective by identifying the most central figures in each community. Central figures are those which appear to have the most connections to other members in each community based on the number of relational ties. To address the network analysis component, the survey contains one question which ask participants to name at most 10 community members that whom they interact with regularly.

The survey used both original and adapted items from prior studies. The core items center around participants' environmental attitudes and prevalence of engagement of pro-environmental behaviors both before and after moving into a THC. Items measuring pro-environmental attitudes and behaviors were drawn from (Takahashi and Selfa 2015); subtle changes were made which included dropping items not pertinent to tiny house enthusiast's as well as expanding the range of the Likert scales used from 3 to 5 points. Items on place attachment are also included and were drawn from (Flagg and Painter II 2019); wording of the Likert scales being used were unified and modified into statements of agreement or disagreement. The survey also includes items which measure the community's impact on them and their environmental attitudes and behaviors.

In addition to questions on pro-environmental attitudes and behaviors, participants were also presented demographic questions about their age, gender, race, education, household size, household income, religion, and employment status. Participants were also presented with the option to receive a copy of the project findings upon completion of the thesis.

Sample frame

This project used a stratified sampling approach to select the tiny house communities (THC). Due to issues of zoning and local ordinances surrounding tiny houses there is currently no list of known THCs within the United States. Therefore, the list of tiny house communities was generated primarily through the use of internet blogs, websites, and social media groups which discuss THCs (for e.g., thespruce.com, tinyhouse.net, tinyhousecommunity.com, tiny house nation on Facebook). THCs were only included in the sampling frame if (1) the community was already established and not in the planning stages, (2) comprised entirely of tiny houses, (3) comprised of primarily tiny houses with some RV's, or (4) consisted of a mixture of smaller structures such as tiny houses, micro homes, vans, or trailers. THCs developed for the homeless or which provide transition housing were not included in the sampling frame. This led to a comprehensive list of tiny house communities located across the US as of July 2020. All communities were then contacted to solicit survey participants. Each community was contacted through a multitude of ways: (1) through the community's email, (2) their phone number, or (3) through a community 'contact us' page located on most community's website. When corresponding with a community through email a script was used (See Appendix A.). Upon making contact, I asked to be pointed to the central point of the contact for the community. This was important as the central community contact would be in charge of sending out the survey link to community members.

Upon contacting each community, I provided the community contact with information about the nature of the survey and also iterated the importance of participating in the survey. More specifically, I stressed the exploratory and foundational nature of the project as well as how the research outcomes might serve to improve the acceptability of THCs. When the point of contact shared interest in participating, they were provided with a survey link with which to send out to the community. The community contact was also provided with an information sheet discussing the specifics of the project and as to why their participation is important, this serves as a template for the community contact to model their email to the community residents. In most cases, the community contact forwarded the initial email script to the community members. For communities that participated, I also asked for the number of emails the community contact sent the survey to help in calculating a survey response rate. Survey administration is discussed in the section below.

Administration of the Network Survey

The network survey was administered using an online survey development platform named Qualtrics. Qualtrics allowed for creation, dissemination of the survey, and exporting of the raw data. Qualtrics also has the flexibility needed to craft a network analysis type survey which was important for this study. Qualtrics collects respondent's IP address which were erased prior to data analysis process. After the survey was programmed into Qualtrics, the link to the survey was sent out to each community contact for dispersal to residents of each community. Upon participants receiving the survey link, they were able to click through the survey questions on their device. Participation was completely voluntary and respondents had the option to withdraw at any time without penalty. Each community contact was also asked to send out reminders to take the survey

in a bet to increase the response rate. Survey administration began on October 7th, 2020 and concluded on December 9th, 2020. The survey response rate was roughly 36%¹ with an n = 64.

Motivation Survey Sample

Content of the Motivation Survey

The content of the survey in the motivations sample centered around testing tiny house enthusiasts' primary motivations for adopting the tiny house lifestyle as detailed in (Mangold and Zschau 2019). This meant testing how important the 5 key identified motivators were to people considering 'going tiny' or who have already 'gone tiny'. As per Mangold and Zschau (2019), the key motivators were (1) Financial Security, (2) Freedom and Autonomy, (3) Simple Living, (4) Meaningful Relationships, and (5) New Experiences. Participants were asked questions which aimed to tap into these themes through the use of matrix questions; motivator questions were devised using the findings of Mangold and Zschau (2019). In addition, the survey also explored both personal and structural factors leading up to the participants transition to the tiny house lifestyle. An example of this would be that participants were no longer living the life they wished to or that they faced financial hardship such as after the recession of 2008. Participants were also asked questions about what kinds of philosophies, movements, and sub-cultures played a key role in their thinking about the tiny house lifestyle. The survey also participants questions regarding what kinds of forces hindered as well as enabled them to 'go tiny'.

Aside from questions regarding motivations, personal structural factors, participants were also asked some basic demographic questions. Demographic questions included things such as age, level of education, relationship status, race, gender, and household income. Participants were

¹ The reported response rate is possibly higher than 36%, however this remains unclear due to some community contacts not providing the number of residents which received the survey. Community contacts were contacted multiple times to attempt to gather a clear indication of how many residents received the survey, but even after 3 attempts some contacts still did not provide this information.

also able to opt into a raffle for a tiny house getaway trip provided by NOAH (National Organization of Alternative Housing). Participants were not compensated for their participation.

Sample frame

Motivation survey sample data comes from research I conducted as part of an undergraduate grant funded project on the tiny house movement at the University of North Georgia. The motivations sample contains survey response data collected from people who attended regional Tiny House Festivals around mostly the southern US in the summer and fall of 2017². Sampling was limited to festivals located within roughly an 8 hour driving distance of the research team. The sampling frame centers around a list of tiny house festivals that occurred around the US in the year 2017. The research team generated a list of 4 Tiny House Festivals located in Georgia (2), Tennessee (1), and Florida (1). Team members then attended each festival and conducted a convenience sample of participants which visited the research team booth.

Administration of the Motivations Survey

The survey was administered to participants at the aforementioned regional tiny house festivals in a multitude of ways: (1) in the form of a paper survey, (2) through an online survey accessible through university provided iPads, or (3) through a scannable QR Code. Research team members were also on site to provide technical assistance and clarification should the survey participants have any inquiries. Team members also provided a sitting space for participants to take their survey. In the rare case that a survey was taken in paper format, team members would hand enter responses into the online survey so as to speed up the data management process. Paper surveys were then securely packed away and shredded upon being entered into the online survey version.

² Participants were sampled through a convenience sample and therefore I do not report a response rate for this sample.

Analytical Strategies

Analysis of both samples encompassed a number of different strategies ranging from descriptive statistics to multivariate ordinary least squares OLS regression modeling with all analysis was conducted in STATA16. Descriptive statistics were performed on both the network and motivations sample in order to craft a demographic profile of the average tiny house enthusiast as well as to identify primary motivations for ‘going tiny’. Creation of the tiny house enthusiast demographic profile consisted of running descriptive statistics on the variables of age, race, gender, household income and education level. Further descriptive statistics were used to analyze the main motivations behind tiny house enthusiast’s decision to ‘go tiny’ specifically identifying the frequency at which people chose security, freedom and autonomy, simple living, meaningful relationships as well as meaningful activities and experiences. Descriptive statistics were also used to analyze the philosophical influences behind tiny house enthusiasts’ interest in living tiny by analyzing the frequency by which Minimalism, Voluntary Simplicity, Environmentalism, Anti-Consumerism, Back-to-the-Land Movement, Thoreau’s Transcendentalism, or Hipster Sub-Culture were selected. I also conducted descriptive statistics on key independent variables like pro-environmental attitudes and behaviors as well as demographic indicators such as age, household income, gender, education level, and race.

In addition to the descriptive statistics, I also ran additional analysis with the network sample such as bivariate regression, correlation analysis, and multivariate OLS regression. Bivariate regressions were used with the independent variables within the network survey to identify variables which exhibit a significant effect on the main dependent variables: pro-environmental behaviors and attitudes. Pearson’s correlation was also conducted with all variables in the network survey to identify variables which highly correlate with one another. Based on the

bivariate OLS models and correlation analysis, I identified the following relevant covariates for the multivariate models: Christian, Community Impact, and Age.

Upon completing the initial descriptive stats, bivariate regressions, and correlation analysis, I moved to modeling of the main dependent variables using a multivariate OLS regression. Separate models were generated for pro-environmental behaviors and attitudes with both utilizing the same independent variable list which included Community Centrality, Community Impact, Age, and Community Attachment. It is important to note that in addition to the aforementioned variables, each respective model also included a measure of prior levels of pro-environmental behaviors and attitudes. This was done in order to account for any possible influence from participants levels of prior pro-environmental behaviors and attitudes that could bias results of the multivariate OLS regression. Assumptions of multivariate OLS regressions are described below.

The multivariate OLS regression models were key to understanding the relationship between age, Christianity, community impact, community centrality, community attachment and tiny house community residents' levels of pro-environmental behaviors and attitudes. It is through a multivariate regression that it is possible to control for certain variables which might influence the variability of sampled indicators such as participants prior levels of pro-environmental behaviors and attitudes.

Multivariate OLS regression has a few key assumptions, specifically (1) it is assumed that the dependent variable is interval-ratio and has a normal distribution, and (2) it is assumed that there is homoskedasticity of our dependent variable at each level of independent variable, such that a linear relationship is clear and that the noise in the degree of freedom is the same, (3) mean independence is assumed, and (3) it is assumed that the collected sample was selected at random

implying that each sampled participant had an equal chance of being selected (Agresti and Franklin 2018; Allison 1999).

After conducting multivariate OLS regressions it was necessary to conduct a host of diagnostic tests to check for the violation of the above stated assumptions. Specifically, this entailed testing for influential cases such as univariate and multivariate outliers as well as multicollinearity. Outliers have the possibility to greatly increase the mean of variables while a case of multicollinearity could lead to greatly inflated standard errors. Furthermore, a violation of homoskedasticity can also lead to inflated standard errors which can therefore bias the estimator. This study checked for both univariate and multivariate outliers. Multicollinearity occurs when two explanatory variables coincide strongly with one another leading to greatly inflated standard errors (Agresti and Franklin 2018). To check for multicollinearity, I examined the variance inflation factor (VIF) of each variable. The VIF score indicates the increase in the variance estimator based on how much explanatory variable x_1 correlates with another explanatory variable x_2 . VIF scores higher than 2.5 indicate significant levels of multicollinearity and suggest that highly correlated variables may need to be removed or ran in their own regression models.

In addition, regression models were also re-estimated using a robust regression in order to further ensure that regression results were not contingent on heteroskedasticity or influential cases such as univariate and multivariate outliers. Unlike multivariate OLS regression, robust regression does not assume homoskedasticity or a lack of influential outliers. Using STATA16 Robust multivariate regression re-estimates model coefficients by eliminating any influential outliers using Cook's distance this is then followed by conducting both Hubert and Bi-weight iterations (Li 1985).

CHAPTER 4: SOCIO-DEMOGRAPHIC PROFILE & MOTIVATIONS OF TINY HOUSE ENTHUSIASTS

Due to a lack of literature on environmentalism within tiny house communities it is pertinent to discuss the pro-environmental nature of tiny house enthusiasts themselves. Specifically, I address, how does living in a tiny house community affect pro-environmental attitudes and behaviors? Addressing this question is important as while prior research demonstrates evidence for the environmentalist nature of tiny house enthusiasts, little if any research has addressed specifically how living in community might affect tiny house enthusiast's environmentalism. With the paucity of research in this area it is helpful to identify how tiny house enthusiasts themselves are pro-environmental which could then translate to pro-environmental tiny house communities. By showing that tiny house enthusiasts are pro-environmental it is possible to then extrapolate these findings to tiny house communities and better understand whether communities nurture or hinder tiny house enthusiasts' environmentalist tenets. Furthermore, conducting this research also has the potential to provide further support for tiny house living as both a form of community development and environmentally sustainable living.

In this chapter, I develop a demographic profile of the average prospective or current tiny house resident. I find the average prospective or current resident is a white, college educated, woman in her mid-40's who makes roughly \$62,500 a year, fitting the mold of a majority of environmentalists. Additionally, I examine the pro-environmental motivations partly guiding participants decision to 'go' tiny. It was found that simple living, security, and seeking meaningful experiences were the top motivations behind choosing to live tiny. I also show how tiny house enthusiasts echo environmentalist tenets specifically through their philosophical influences in 'going tiny'; the top three of which were minimalism, voluntary simplicity, and environmentalism.

Lastly, tiny house enthusiast's pro-environmental nature was also demonstrated by their high level of interest in living more eco-friendly and off-grid.

In addition, it was also found that the top 3 philosophical influences of tiny house enthusiasts were minimalism, voluntary simplicity, and environmentalism, all of which to some degree include a focus on environmentalism. Minimalism specifically advocates for the consumption of less consumer goods and voluntary simplicity is often quoted as "living in a way that is outwardly simple and inwardly rich", both implicitly advocating the for the consumption of less thereby also being enacting more pro-environmental notions (Elgin and Mitchell 1977:13). It was also demonstrated that almost half of the motivations survey respondents wished to live more eco-friendly or live off-grid. These findings serve to further illustrate how tiny house enthusiasts and more importantly, tiny house communities embody environmentalist tenets. The motivations study aimed to provided evidence for the environmentalist nature of tiny house enthusiasts and motivate the network survey which specifically measures pro-environmental attitudes and behaviors.

Socio-Demographic Profile of Tiny House Communities

A consistent theme in the literature is that tiny house enthusiasts tend to be college educated, white women making a middle income salary (Boeckermann et al. 2019; Saxton 2019; Summers 2021). Boeckermann's (2019) study which includes a sample over 75% female, over 95% white, with over 40% of participants exhibiting incomes over \$60,000 alongside with over 40% of respondents between the ages of 40-66 (Boeckermann et al. 2019). This demographic profile was also reiterated by (Saxton 2019) whose sample was over 75% female, over 95% white, with the average participant aged between 35 and 54, making on average income between \$30,000 to \$49,000 a year. Due to the trend in the literature, it was important to explore whether the two

datasets used in this study also follow the trend line. Similar to past literature, in the context of my own research I find that the average tiny house enthusiast is primarily a white, middle-aged, college educated female who makes a household income of about \$62,500 a year. This follows findings from other studies which demonstrated a similar demographic profile (Boeckermann et al. 2019; Mutter 2013; Saxton 2019; Summers 2021).

Table 3. Socio-Demographic Profile of Tiny House Communities

<i>Variable</i>	Network Survey				Motivations Survey			
	Mean	Min	Max	N	Mean	Min	Max	N
Age	43	18.00	76.00	64	40 ¹	1.00	6.00	124
Income	\$62,500 ²	1.00	7.00	64	\$62,500 ²	1.00	6.00	125
Education Level	College Degree	1.00	5.00	64	College Degree	1.00	5.00	124
Gender	Female	0.00	1.00	64	Female	0.00	1.00	126
Race	White	0.00	1.00	64	White	0.00	1.00	126

Note: Age¹ mean is average of the closest ordinal category. Income² mean is also average of close ordinal category. For age in sample 2 participants were asked to select the category that fits them.

Table 3 presents the demographic profile of the average tiny house resident based on respondent data from the network and motivations surveys. Income was measured by having respondents choose the income category that fits them. For both surveys, participants had the option to choose (1) \$35,000 to \$49,999; (2) \$50,000 to \$74,999; (3) \$75,000 to \$99,999; (4) \$100,000 to \$124,999; (5) \$125,000 to \$149,999; or (6) More than \$150,000. In terms of education level, respondents chose from (1) Some Highschool, (2) Highschool, (3) Technical Degree, (4) Some College, (5) College Degree, or (6) Graduate Degree (MBA, M.A., PhD.). Gender was kept simple with options for Male, Female, or other. For Race respondents had the option of choosing (1) White, (2) Hispanic or Latino, (3) Black or African American, (4) Native American or American Indian, (5) Asian/Pacific Islander, or (6) Other. The measurement of age varies across surveys. The network survey asked for the respondents birthyear from which age was generated later by subtracting the birth year from the year 2020. The motivations survey measured age through ordinal categories, participants had the option of choosing (1)18-24, (2) 25-34, (3) 35-44,

(4) 45-54, (5) 55-64, (6) 64 and older. To streamline comparisons with the network sample, the average of the mean ordinal category from the motivations survey was used and is presented in Table 3.

According to Table 3, the average tiny house enthusiast is a middle aged, college educated, white woman, who makes an annual household income of roughly \$62,500. Using two different samples which ended up with similar results illustrates some of the homogeneity that exists within the tiny house movement literature. Demographic profiles similar to that Table 3 have also been found elsewhere (Boeckermann et al. 2019; Carras 2019; Mutter 2013; Saxton 2019; Shearer 2019; Summers 2021). It should also be noted that the socio-demographic profile was found among two different samples of tiny house enthusiasts which were collected at two different points in time and geographic locations. Thereby Table 3 coupled with the broader literature provides evidence to support the notion that the tiny house movement is somewhat of a class specific phenomenon. Furthermore, findings from this study and others provides evidence to support that the demographic profile is generalizable to the wider population of tiny house enthusiasts.

The Motivations & Philosophies of Tiny House Communities

In addition to the demographic makeup of a tiny house enthusiast it is also important to briefly highlight some of the primary motivations behind ‘going tiny’. Literature on the tiny house movement is in its infancy, but from what is available it is possible to glean some insights into what motivates individuals to adopt this lifestyle. Some of the earliest academic work done on the tiny house movement was by Amelia Mutter back in 2013 when she conducted an exploratory analysis of the motivations and challenges to living ‘tiny’. Through interviews and a content analysis, Mutter identified 6 primary motivators behind peoples move towards ‘living tiny’: simplicity, sustainability & environmentalism, cost, freedom & mobility, sense of community, and

interest in design (Mutter 2013). These themes were then quantitatively tested through the work of (Boeckermann et al. 2019), who found that the themes of sense of community, empowerment, interest in design, and sustainability and environmental impacts were the most salient motivators; saliency was based on the percentage of people that highly agree with a theme being a key motivator for them. Later, Mangold and Zschau (2019), also conducted an exploratory study on the motivations behind movement adherent’s decisions to go tiny. They uncovered similar findings to that of the Mutter and Boeckermann in identifying 5 key motivators: financial security, freedom & autonomy, simple living (includes concerns over environmental sustainability), meaningful relationships, and new experiences. The first four neatly map on to previous findings by Mutter and Boeckermann. Sense of Community was also seen as a big motivating factor and was discussed at length in (Willoughby et al. 2020). Olson (2020) also uncovered similar findings in that the primary motivators revolved around financial, simplicity, freedom, mobility, community, building, and sustainability.

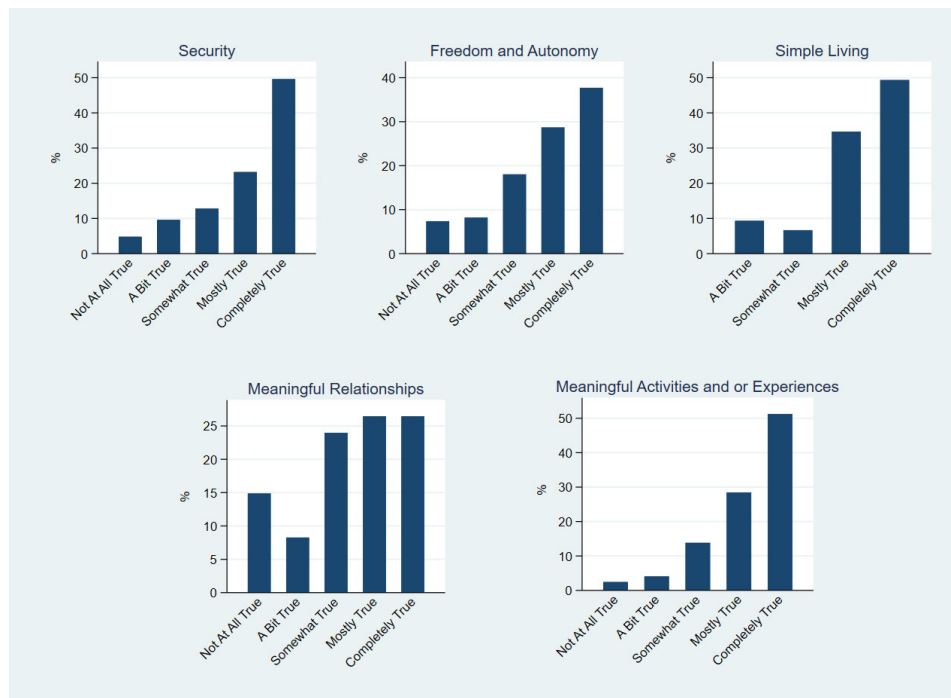


Figure 2. Key Motivations of Tiny House Enthusiasts

Figure 2 shows the primary motivations for residing in tiny house communities based on the motivations survey. Respondents were asked to fill out a matrix question that included statements measuring all five core motivators: security, freedom and autonomy, simple living, meaningful relationships, meaningful activities and experiences. Specifically, respondents were asked to rate the following statement: “I believe living in a tiny house saves me time and money so that I can....”. The statement listed for security was “feel more secure and worry less about life”. For freedom and autonomy, it was “regain control over my life”. For simple living it was “live a life more consistent with my values”. For meaningful relationships it was “develop more meaningful relationships with others” and for meaningful activities and experiences it was “engage in more meaningful activities and/or experiences”. Respondents were asked to rate each motivation with the following options: (1) Not At All True, (2) A Bit True, (3) Somewhat True, (4) Mostly True, (5) Completely True, (6) Not Applicable.

Figure 2 shows over 50% of the sample from the survey identified security, simple living, and meaningful activities as being important to respondents. This is especially important to note as using insights from (Mangold and Zschau 2019), the simple living motivator includes interests in environmental sustainability. The importance of simple living is evidenced by the roughly 50% of motivation survey respondents identified simple living as being ‘completely true’ for them in their transition and or interest in tiny living.

Table 4. Philosophies of Tiny House Communities

<i>Philosophies</i>	Frequency	Percent
Minimalism	77	65.3
Voluntary Simplicity	58	49.2
Environmentalism	49	41.5
Anti-Consumerism	46	39.0
Back-To-The-Land Movement	30	25.4
Thoreau's Transcendentalism	10	8.5
Hipster Sub-Culture	8	6.8

Note: n = 118, participants had option to choose their top 3 philosophies.

In addition to the primary motivations driving people to adopt the tiny house lifestyle, it is also important to examine the philosophical influences of tiny house enthusiasts. Mangold and Zschau (2019) demonstrated that the tiny house movement draws philosophical inspiration from other lifestyle and philosophical movements such as voluntary simplicity and minimalism. This provided the impetus to initially measure which movements might be a key driver of the tiny house philosophy. Measuring the philosophical influences allows for a better understanding of the role that environmentalism plays in the tiny house movement.

Table 4 presents the major philosophies among tiny house residents; each participant had the option to choose their top 3. Table 4. illustrates how the respondents identified minimalism, voluntary simplicity, and environmentalism as the top 3 philosophical influences in their transition to joining the tiny house lifestyle. Important to note is that the top 3 choices all embody pro-environmental tenets in their philosophy. More importantly however is that over 40% of respondents specifically identified environmentalism as a key philosophical influence, providing further evidence for the pro-environmental nature of tiny house enthusiasts. Minimalism's high rank can be partially attributed to the fact that many of its tenets fall in line with tenets of the tiny house movement such as a focus on living with less, reducing debt, and creating more time to do things that one enjoys (Mangold and Zschau 2019). In addition, similar to the tiny house movement, minimalism is also a lifestyle movement that went mainstream shortly after the great recession of 2008 and gained widespread notoriety with 2011 publication of *Minimalism: Live a Meaningful Life* by Joshua Fields Millburn & Ryan Nicodemus. While minimalism for the most part does not explicitly mention environmental considerations, it is clear that "engaging in minimalism is choosing a sustainable lifestyle" and thereby exhibits an implicit pro-environmental orientation (Kang, Martinez, and Johnson 2021:809).

To measure the influence of different philosophical approaches, the motivation survey asked respondents, “Which of the following movements or sub-cultures have shaped your thinking about tiny house living the most?”. Respondents were able to choose up to three philosophical influences from the following: (1) Minimalism, (2) Voluntary Simplicity, (3) Environmentalism, (4) Anti-Consumerism, (5) Back-To-The-Land Movement, (6) Thoreau's Transcendentalism, (7) Hipster Sub-Culture, or (8) Other, please explain. It should also be noted that not all participants chose to answer this question.

Pro-Environmental Behaviors in Tiny House Communities

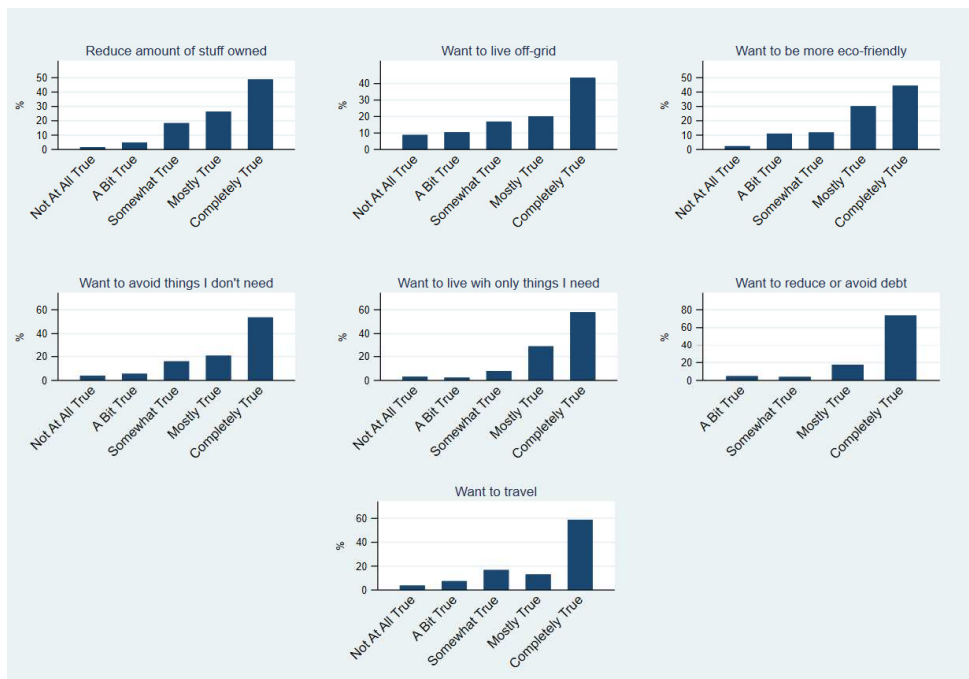


Figure 3. Importance of Specific Behaviors to Tiny house enthusiasts

On the one hand Figure 2 presents important findings regarding the primary motivations behind the transition to tiny house living, but on the other hand it does little to explore the nature of what sustainability practices are important to tiny house enthusiasts. In addition, while the tiny house movement is often sold as a path to financial freedom and more sustainable living, no research has explicitly measured the pro-environmental behaviors of tiny house enthusiasts and

more specifically tiny house community residents. Figure 3 fills this gap by illuminating the importance of specific behaviors to people interested in living tiny or who already living in a tiny house, many of which embody an implicit sustainability focus.

According to Figure 3, over 40% of respondents chose “completely true” when it came to living off-grid or wanting to be more eco-friendly. Over 40% of respondents also chose “completely true” in reference to reducing the amount of the stuff they own or avoiding things they do not need. While tiny house enthusiasts’ interest in living off-grid and being more eco-friendly directly signify a sustainability focus, their interest in living with less and avoiding unneeded possessions can also be viewed as having a sustainability focus through reduced engagement in materialistic consumptive practices. It should also be noted that the motivation survey sampled respondents both interested in tiny house living or who currently live in a tiny house. In the case of living off-grid and being more eco-friendly, participants currently living in a tiny house exhibited a higher percentage of choosing completely true and mostly true; potentially a result of being currently engaged in these behaviors. Figure 3 thereby provides further evidence to support the environmentalist nature of tiny house enthusiasts and provides some insight into the potentially environmentalist nature of tiny house communities.

To gather data for Figure 3, respondents of the motivation survey were asked to evaluate a series of statements in conjunction with the main statement: “Being able to live in a tiny house is important to me because I want to....”. Respondents then had the option to rate each statement in the matrix as: (1) Not At All True, (2) A Bit True, (3) Somewhat True, (4) Mostly True, (5) Completely True, or (6) Not Applicable. Each participant was asked to rate the following statements “reduce the amount of stuff I own”, “live off-grid and/or be more self-reliant”, “be more

eco-friendly”, avoid buying things I don’t really need”, “live with only the things that are necessary and/or meaningful to me”, “reduce and/or avoid debt”, “travel”, or “other, please explain”.

Conclusion

From the above presented findings, it is clear that tiny house enthusiasts exhibit tenets of environmentalism. In addition, it was also demonstrated that the average tiny house enthusiast is primarily a white, middle-aged, college educated female who makes roughly \$62,500 a year. The importance of key motivators such as security and simple living was also demonstrated. It was also found that the main philosophical motivations driving tiny house enthusiasts were minimalism, voluntary simplicity, and environmentalism, all of which embody tenets of environmentalism. In addition, figure 3 illustrated the behaviors and practices important to tiny house enthusiasts, specifically of interest here was the high percentage of respondents who viewed living off-grid or being more eco-friendly as being mostly or completely true for them in their interest in tiny house living. These findings further solidify the pro-environmental nature of tiny house enthusiasts and provides some insight into the potentially pro-environmental nature of tiny house communities.

The big takeaway here is that concerns about environmental sustainability play a key motivational behind choosing to ‘go tiny’. While the presented findings in conjunction with past research indicates that tiny house enthusiasts embody environmentalist tenets and considerations, none measure pro-environmental behaviors and attitudes. Furthermore, even less is known as to how tiny house communities might impact tiny house enthusiasts’ attitudes and behaviors related to environmentalism. Thereby it is important to investigate how tiny house communities impact the pro-environmental behaviors and attitudes of residents. It is also unclear how community integration and attachment influence pro-environmental behaviors and attitudes of residents.

CHAPTER 5: COMMUNITY INTEGRATION & PRO-ENVIRONMENTAL BEHAVIORS & ATTITUDES IN TINY HOUSE COMMUNITIES

A major aim of the thesis is to examine the impact of community integration and attachment on the pro-environmental behaviors and attitudes of tiny house residents. This aim fills an important gap in the literature on the tiny house movement, specifically regarding the pro-environmental nature of tiny house communities. The paucity of research on pro-environmental attitudes and behavior within tiny house communities raises three important questions. First, how does living in a tiny house community affect pro-environmental attitudes and behaviors? Second, what is the role of community integration in increasing pro-environmental attitudes and behaviors among tiny house community members. Third, what is the role of community attachment in increasing pro-environmental attitudes and behaviors among tiny house community members?

While little academic literature exists on tiny house communities and their role in facilitating pro-environmental behaviors and attitudes, tiny house enthusiasts themselves have been found to exhibit an interest in environmentalism. Often couched in the language of simple living or simply interest in environmentalism by others within the tiny house literature (Boeckermann et al. 2019; Mangold and Zschau 2019; Mutter 2013; Saxton 2019; Summers 2021). Issues of environmental sustainability have been implicated as a driving factor as to why some tiny house enthusiasts choose to embrace the lifestyle (Boeckermann et al. 2019; Mangold and Zschau 2019; Mutter 2013; Saxton 2019; Summers 2021). This interest was also explicitly echoed by some tiny house community webpage. Figure 2 provided excerpts from some tiny house community webpages demonstrating their explicit focus on environmentalism. While I have provided evidence to support the assertion that tiny house enthusiasts and their respective tiny house communities embody tenets of environmentalism it is still largely unknown how community integration in these communities impacts an individual's levels of pro-environmental attitudes and behaviors.

Based on data from an original network survey and multivariate regression models, I find residents who are centralized in community networks exhibit greater pro-environmental behaviors net of their pre-residency behaviors, age, religion, community impact and other covariates. Surprisingly, I find only age significantly predicted pro-environmental attitudes of residents, net of their centrality, prior environmental attitudes, and other covariates. Thus, it was found on the one hand that community integration is a significant factor in predicting pro-environmental behaviors, but not attitudes. Community attachment however was not found to be a significant predictor of either pro-environmental behaviors or attitudes.

Pro-Environmental Attitudes & Behaviors in Tiny House Communities

The majority of research on the tiny house movement has focused primarily around understanding the motivations behind adoption of the lifestyle and how tiny house communities may serve as a solution to the problem of homelessness. In the same vein, there also continues to be a paucity of research on the pro-environmental behaviors and attitudes of tiny house enthusiasts and their requisite communities. From the literature and my own research, it is clear that tiny house enthusiasts do exhibit a degree of environmentalism, however, little remains known as to how this plays out in the context of a tiny house community. I have shown that tiny house enthusiasts are deeply interested in behaviors such as living more eco-friendly and living with less as well as even off-grid, all of which embody environmentalist tenets. This provides some evidence to show that tiny house communities themselves might also be pro-environmental simply based on the fact that a tiny house community is a group of tiny house enthusiasts living in physical proximity of one another. From this point it is possible to view the tiny house movement and more importantly tiny house communities as sharing many similarities with cohousing in regard to sustainably living. Due to the deep similarities with cohousing, the current adoption of tiny house communities within

the tiny house movement should be viewed as an American third wave of the cohousing movement with its own specific tenets, following a more traditional American subdivision layout. While no studies have specifically studied the pro-environmental nature of tiny house communities, looking to cohousing provides some insight into what factors might be at play in fostering pro-environmental behaviors and attitudes, such as community integration and community attachment.

Cohousing gained an environmental focus in its second wave iteration, spurring development of these communities in recent decades (Sargisson 2012; Williams 2005). Scholars have demonstrated the pro-environmental nature of cohousing whether it is through attitudes, behaviors, or through their lower overall carbon footprint (Daly 2017; Sanguinetti 2014; Sargisson 2012). From the motivation survey, I found that tiny house enthusiasts embodied an interest in pro-environmental behaviors and also drew philosophical influence from minimalism, voluntary simplicity, and environmentalism, all of which embody environmentalist tenets. Accordingly, I expect the following:

H1. Tiny house enthusiasts who live in tiny house communities exhibit higher pro environmental behaviors and attitudes when compared to their prior living arrangement.

This raises the question specifically as to why people who live in tiny house communities have higher levels of pro-environmental behaviors and attitudes. A tiny house enthusiasts' level of community integration and community attachment are implicated as some of the main driving factors, but this remains to be seen.

Community Integration & Pro-Environmental Attitudes & Behaviors in Tiny House Communities

Community integration refers to the development of social capital in a community which should play a key role in fostering pro-environmental behaviors and attitudes. Prior research shows individuals with higher levels of social capital are exposed to a wider set of information and

views, which could lead to increased exposure to pro-environmental behaviors and attitudes (e.g. Granovetter 1973). And other studies show levels of pro-environmental behaviors are positively associated with interactions with dissimilar others (Geerts et al. 2020). Accordingly, integration into community networks should directly influence intentions of engaging in pro-environmental behaviors, regardless of a community's level of social capital (Cho and Kang 2016).

Social capital has also been identified as a key factor in reducing the gap between pro-environmental outcomes and attitudes. For example, social evenings in communities provide prime opportunities for learning about pro-environmental behaviors and practices (Macias and Williams 2014). And individuals with higher levels of social capital have been shown to be more inclined to take action to reduce the impacts of climate change while also supporting policies related to climate change (Hao et al. 2020).

It was demonstrated prior that tiny house enthusiasts exhibit a degree of environmentalism in their decision to 'go tiny' and are interested in living in a more sustainable manner. It is therefore logical to assume that a community of tiny house enthusiasts might embody pro-environmental behaviors and attitudes. This becomes important in the context of community integration, specifically that simply being part of the community would expose members to a potentially wider set of environmentalist tenets and introduce one to new pro-environmental attitudes and behaviors. The tiny house community acts as a place for which environmentalist tenets can be disseminated and shared with members leading to a potential increase in members' levels of pro-environmental behaviors and attitudes. The tiny house community produces a synergistic effect in which members learn new pro-environmental behaviors and practices from one another due to the exposure to new ideas similar to that proposed by Granovetter (1973). Thus, it is theorized that the more socially

integrated into a community an individual is the higher their levels of pro-environmental attitudes and behaviors are. Accordingly, I expect the following:

H₂. Community integration is positively associated with pro-environmental attitudes and behaviors among tiny house community members.

Prior studies show attachment to communities influences environmental concern and pro-environmental behaviors among residents (Buta et al. 2014). Community attachment used here refers to the “emotional —usually positive— bond between a person and setting” (Brehm et al. 2013:523) For example, research finds a positive association between a ‘sense of place’ and pro-environmental behavior (Walker and Chapman 2003). Manzo and Perkins (2006) further concluded that people tend to specifically protect places that provide richness to their lives or in the words of Hummon (1992), places in which people are emotionally invested. The connection between place attachment and pro-environmental behaviors has most often been observed within the sphere of public parks and protected spaces (Buta et al. 2014; Halpenny 2010). A recent meta-analysis also found that overall place attachment tends to have a positive effect on pro-environmental behaviors, leading researchers to view attachment as fostering feelings of belonging which then lead to the promotion of civic activities that include environmentally responsible behaviors (Daryanto and Song 2021). Most importantly Attachment has overall been implicated as a key predictor of pro-environmental attitudes and intentions (Halpenny 2010; Pei 2019; Rokicka 2002). It is theorized that individuals highly attached to the community or a place should also demonstrate higher levels of pro-environmental behaviors and attitudes than those who are not, thereby I also expect that:

H₃. Community attachment is positively associated with pro-environmental attitudes and behaviors among tiny house community members.

Data & Measurement

The network survey sample was administered to residents of tiny house communities across the U.S. to (1) understand how participants' pro-environmental attitudes and behaviors potentially change upon moving into a tiny house community, (2) to understand the importance of place attachment in participants' pro-environmental attitudes and behaviors, and (3) to understand the role of social capital in facilitating tiny house enthusiasts' pro-environmental attitudes and behaviors among residents. The network survey was administered using Qualtrics. The link to the survey was then sent out to each community contact for dispersal and resulted in a sample size of 64. The survey response rate was roughly 36%.

The network survey used a stratified sampling approach to select tiny house communities (THC). Tiny house communities were identified through internet blogs, websites, and social media groups which discuss THCs. THCs were sampled if (1) the community was already established and not in the planning stages, (2) comprised solely of tiny homes, or (3) comprised of primarily tiny homes with some RV's, or (4) comprised of a mixture of smaller structures such as tiny houses, micro homes, vans, or trailers. To confirm the nature of a tiny house enthusiasts' residence, respondents were asked if they live in a tiny house as opposed to another housing structure. Communities were contacted to solicit survey participants. Each community was contacted either through (1) the community's email, (2) their phone number, or (3) through a 'contact us' page on a community's website. Correspondence with each community was limited to the community contact, the central point of the contact of each community. Each community contact was provided with project specifics and reasoning as to why their participation is important.

Dependent Variables

Pro-Environmental Behaviors

Survey participants were asked about their level of engagement in pro-environmental behaviors both prior to and after joining a tiny house community. A respondent's engagement of pro-environmental behaviors prior to joining a community was measured using a matrix question which asked about their frequency of engagement in specific behaviors: "In the 6 months prior to moving to (X Community), how frequently did you engage in the following?". Their engagement after joining a community was measured by the following statement: "Since moving to (X Community), how frequently do you engage in the following?". Respondents were measured with a 5-point ordinal scale of frequency of engagement ranging from never (1) to always (5). Respondents rated their frequency of engagement in the following behaviors: "Buy biodegradable or recyclable products", "Reduce household trash by buying products that come with less packaging", "Use a rainwater catchment system", "Use Solar", "Donate money to environmental organizations", "Recycle", "Compost household kitchen waste", "Grow my own food", "Share resources such as home appliances, tools, or a vehicle", "Drive my car to work, the grocery store, a shopping center, etc" and "Ride my bike to work, the grocery store, a shopping center, etc".

Each respondents' responses were collapsed into an additive scale score of their pro-environmental behaviors. The prior behaviors index was found to have a scale reliability coefficient of .70 while the post behaviors index had a scale reliability coefficient of .72. Both scales were normalized to range from 0 to 100.

Pro-Environmental Attitudes

Respondents answered a similarly formatted matrix question about their levels of pro-environmental attitudes both prior and after joining a tiny house community. Prior levels were

measured by asking: “In the 6 months prior to moving to (X Community), to what extent would you have agreed or disagreed with the following statements?”. Attitudes post joining the community were measured by the following: “Since moving to (X Community, to what extent would you agree or disagree with the following statements?”. Respondents rated their level of agreement with each statement using a 5-point ordinal scale ranging from strongly disagree (1) to strongly agree (5). For both prior and post joining a community, respondents were presented with the following statements “I think environmental issues are important”, “When I see or hear a news story about an environmental issue, I pay attention to that story”, “I am concerned about the state of the environment”, “The public should worry about climate change”, “The public has a responsibility to preserve natural resources for future generations”, “My individual actions can make a difference regarding global climate change”.

Each respondents’ responses were collapsed into an additive scale score of their pro-environmental attitudes. The prior attitudes index had a scale reliability coefficient of .91, while the post attitudes index had a scale reliability coefficient of .87. This scale was also normalized to range from 0 to 100.

Pro-environmental attitudes and behaviors items came from (Takahashi and Selfa 2015), slight changes were made like expanding the Likert scale range from 3 to 5 points and removing items not specific to tiny house enthusiasts.

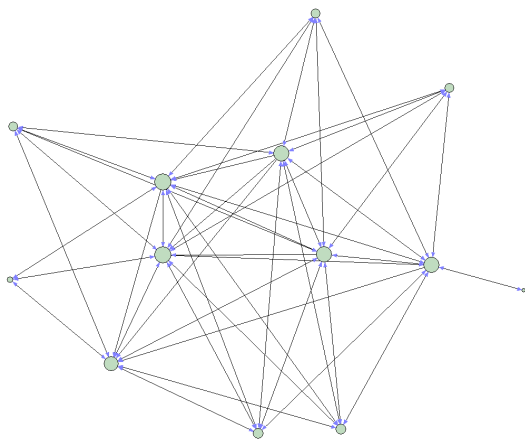
Independent Variables

Community Integration

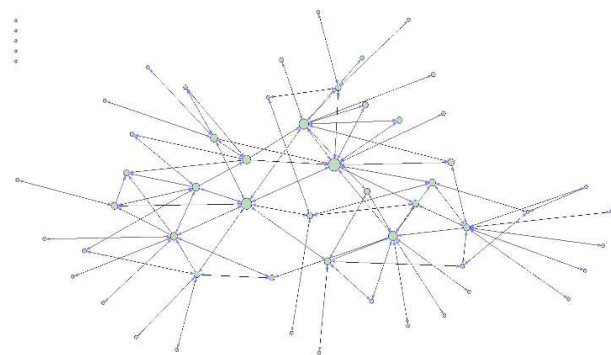
Robert Putnam’s work on social capital provides some useful tools to analyze the social capital of a community, specifically through bonding and bridging capital (2000). These concepts help illuminate both the nature of social relations within a community and how they lead to the

generation of social capital. Bonding capital refers to networks of social relationships that are “good for undergirding specific reciprocity and mobilizing solidarity”, thereby in this case relationships that reinforce existing social structures and ideas such as pro-environmental behaviors and attitudes (Putnam 2000:22). Bridging capital refers to social networks that “are better for linkage to external assets and for information diffusion”, or plainly stated, links to other networks of relationships, information, and resources that are outside of the community (Putnam 2000:22). For example, a tiny house community lacking specific resources might reach outside the community to ‘bridge’ the gap in knowledge or resources, facilitating development of social capital.

Community integration was measured through the use of a name generator item on the network survey. Name generators are commonly used within social network analysis to generate the social networks of respondents. Accordingly, respondents were asked the following: “Please list at most 10 people that you interact with regularly at (X Community). Please include their first name and last initial”.



High Density Network, Density = 0.545



Low Density Network, Density = 0.0149

Figure 4. Social Network Density Figures

Note: Density of ties is the total of number of ties divided by the number of possible ties.

Figure 4 presents examples of high and low density social networks in tiny house communities. The left-hand graph illustrates a community from the study that exhibited high density. Density is traditionally viewed as the total number of ties divided by the total number of possible ties and produces a coefficient between 0 and 1. The higher the density, the more number of close looped ties indicating that within a dyad both members are tied and know one another. Thereby the high-density network indicates a community in which community members are highly connected. This is not the case with the low-density graph. This is a community in which only a few members are highly connected and hold the majority of social connections in the community. Noticeable are the nodes which are not connected to anyone, these are ties mentioned but that have no connections to anyone else. It is also important to note that the density of both networks can be highly reliant on the size of the community and the number of people that completed the network survey.

Data from this item were exported into UCINET6 to generate eigenvector centrality scores. Eigenvector centrality is a measure of how well connected one node in a network is connected to other well connected nodes. A person with few connections would exhibit a relatively low eigenvector score, unless these few connections were well connected to others, then the participant would exhibit a higher score (Hansen et al. 2020). Eigenvector centrality is useful in that it helps to identify the most central nodes in the network, thereby the more central a node, the more influential the node. Each survey respondent Centrality scores are reported with a value from 0 to 1 for each participant in the study.

Community Impact

Community impact was measured by asking participants the following: “Living in (X Community) has...”. Respondents then rated their level of agreement with each statement using a

5-point ordinal scale ranging from strongly disagree (1) to strongly agree (5). Statements presented were as follows: “increased my awareness of issues related to the environment”, “provided me with the knowledge on how to reduce my impact on the planet”, “led me to consume more environmentally friendly goods”, “caused me to behave in more environmentally friendly ways”. Responses to these questions were also compiled into an index referred to as community impact. The index exhibited a scale reliability coefficient of .91. This scale was also normalized to range from 0 to 100.

Community Attachment

Community attachment was measured through another matrix question by asking respondents to “Please rate your level of agreement with the following statements”. Respondents rated their level of agreement using a 5-point ordinal scale that ranged from strongly disagree (1) to strongly agree (5). Respondents were presented with the following items: “In general, I feel at home in (X Community)”, “I am interested in knowing what goes on in (X Community)”, “Being a resident of (X Community) is like have a group of close friends”, “I would be upset about moving from (X Community)”, “I consider (X Community) to be close knit”, “I frequently attend the events held within (X Community)”. Attachment items were drawn from (Flagg and Painter II 2019). Likert scale wording was unified and modified into statements of agreement or disagreement. Item responses were condensed into another index, apply titled community attachment. The index yielded a scale reliability coefficient of .8508 and was also normalized to be out of a score of 100.

Christianity

Respondents were also asked about their religion through the question “What is your religion?”. Respondents had the option of choosing from: “Christian”, “Catholic”, “Mormon”,

“Jewish”, “Muslim”, “Buddhist”, “Hindu”, “Atheist”, “Agnostic”, “No Religion”, or “Any other religion, please specify”. Christian exhibited the highest frequency and was included in the later regression models by transforming the Christian response into a binary variable. Any responses for Catholic or Mormon were also collapsed into the Christian binary variable.

Age

Age was measured by asking respondents “What is your year of birth? (please enter a four digit year)”. Participant’s responses were then subtracted from the year 2020 to generate the age of the participant. Ages were kept in a continuous form and not grouped into categories.

Table 5. Summary Statistics of Outcome & Covariates

<i>Variable</i>	Mean	SD	Min	Max	N
Prior Pro-Environmental Behavior	53.16	26.09	0.00	100.00	65
Post Pro-Environmental Behavior	52.46	23.50	0.00	100.00	64
Prior Pro-Environmental Attitudes	71.51	29.06	0.00	100.00	65
Post Pro-Environmental Attitudes	78.81	24.38	0.00	100.00	64
Christian	0.40	-	0.00	1.00	62
Community Impact	61.86	23.12	0.00	100.00	65
Eigenvector Centrality	25.61	16.00	0.00	61.10	69
Community Attachment	65.87	24.14	0.00	100.00	65
Age	42.97	15.34	18.00	76.00	64

Table 5 provides summary statistics of the main independent and dependent variables in the study. Important to note here are the rather high means shown for both prior and post pro-environmental attitudes. This illustrates that tiny house enthusiasts moving into tiny house communities already hold high levels of pro-environmental attitudes.

Analytical Strategies

The effects of community integration and community attachment on pro-environmental behaviors and attitudes is measured using multivariate ordinary least squares OLS regression

models. Initially, Pearson's correlation was estimated and tested for the hypotheses. Additionally, these correlations were utilized to identify relevant control variables for the regression models. Based on bivariate OLS regressions and the correlations, Christian, Community Impact, and Age were identified as key covariates to include in multivariate OLS models.

Separate OLS models were created for pro-environmental behaviors and attitudes. Each model was specified with the following independent variables: Community Centrality, Community Impact, Age, and Community Attachment. Additionally, both models also included a measure of prior levels of pro-environmental behaviors and attitudes to control for the initial levels of the respondent's prior pro-environmental behaviors and attitudes which may influence their current pro-environmental behaviors and attitudes. As a robustness check, I estimated interaction models to determine whether prior behaviors and attitudes conditioned the effects of community centrality on attitudes and behavior. Null findings for the interaction coefficient suggest the effect of centrality is not contingent on the respondent's prior attitudes and behaviors before residing in the community.

I also conducted several diagnostic tests to check for the B.L.U.E. assumptions of OLS regression. Specifically, I tested for the influence of univariate and multivariate outliers, multicollinearity, and heteroskedasticity. Outliers bias the regression coefficient by over- or under-estimating the linear relationship between the covariates and the dependent variable. Multicollinearity and heteroskedasticity increase the risk of committing a Type II error in OLS regression through inflating the standard errors of variables in the analysis.

I examined the variance inflation factor (VIF) of each variable used in the models to evaluate multicollinearity. The VIF score indicates the increase in the variance estimator based on how much explanatory variable x_1 correlates with another explanatory variable x_2 . VIF scores

higher than 2.5 indicate significant levels of multicollinearity and suggest that highly correlated variables may need to be removed or ran in their own regression models.

I examined the influence of outliers and heteroskedasticity by re-estimating the models with robust regression. None of the variables were found to be heteroskedastic.

Results

I compared prior and post pro-environmental behaviors and attitudes using 1 sample t-tests, also referred to as independent samples t-test. This was done to compare the mean differences between prior and post pro-environmental behaviors and attitudes. I find no significant difference between prior pro-environmental behaviors (M = 53.62, SD = 26.04) and post pro-environmental behaviors (M = 52.46, SD = 23.50) within the sample ($p > .05$). I do however find a significant difference between prior pro-environmental attitudes (M = 71.95, SD = 29.07) and post pro-environmental attitudes (M = 78.81, SD = 24.38) within the sample ($p < .01$). Thereby moving to a tiny house community significantly raises the level of pro-environmental attitudes of residents.

Table 6. Pearson's Correlation Summary Statistics

<i>Variable</i>	1	2	3	4	5	6	7	8	9
Post Pro-Environmental Behavior (1)	1	-	-	-	-	-	-	-	-
Post Pro-Environmental Attitudes (2)	.31*	1	-	-	-	-	-	-	-
Prior Pro-Environmental Behavior (3)	.58***	.12	1	-	-	-	-	-	-
Prior Pro-Environmental Attitudes (4)	.27*	.78***	.24	1	-	-	-	-	-
Christian (5)	-.13	-.32*	-.06	-.25	1	-	-	-	-
Community Impact (6)	.44***	.21	.01	.14	.01	1	-	-	-
Eigenvector Centrality (7)	.28*	.14	-.15	.09	.26*	.33**	1	-	-
Age (8)	-.25*	-.31*	.06	-.18	.26*	.05	-.11	1	-
Community Attachment (9)	.29*	.06	.02	.03	.24	.45***	.44***	.07	1

Note: significance at * $p < .05$; ** $p < .01$; *** $p < .001$

Table 6 presents the results of the Pearson's correlation summary statistics. Contained within the table are the results of all pertinent variables used in the initial stages of the analysis. Correlations were used to help identify variables that might be of use in the construction of the

later multivariate OLS regression models. From this it was identified that community impact, community centrality, age, and community attachment are all important variables to include in OLS models. These variables were included in the OLS models because they were found to be significantly correlated with post pro-environmental behaviors and attitudes. This also backs up some of the findings initially presented on these variables within the literature review.

Table 7. Demographic only models of Post Pro-Environmental Behaviors and Attitudes

<i>Variables</i>	Post Pro-Environmental Behaviors	Post Pro-Environmental Attitudes
Age	-0.396* (0.218)	-0.496** (0.196)
Income	2.698 (2.063)	-4.529** (1.879)
Education Level	-0.723 (3.665)	0.161 (3.260)
White	9.060 (9.087)	16.02* (8.550)
Female	6.059 (7.212)	5.698 (6.424)
Christian	-1.922 (6.849)	-7.622 (6.063)
Constant	52.56*** (16.89)	99.51*** (15.48)
Observations	61	61
R-squared	0.121	0.318

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 7 presents estimates from OLS regression models based on the demographic profile of tiny house residents. Based on these models, I find age is negatively associated with environmental attitudes and behaviors while income was negatively associated with environmental attitudes. Additionally, I find white residents are more likely to hold pro-environmental attitudes compared to non-white residents.

It is also interesting to note that in these models that gender had no effect on post-pro-environmental behaviors or attitudes as prior research has shown that women tend to exhibit higher levels of environmental concern (Combes et al. 2018; Davidson and Freudenburg 1996; Dzialo

2017; McCright and Xiao 2014). Furthermore, from the demographic only models it is also clear that demographics alone explain only a small fraction of the variance in the sample. Demographics explain roughly 12% of the variance in post pro-environmental behaviors and about 32% of the variance of pro-environmental attitudes.

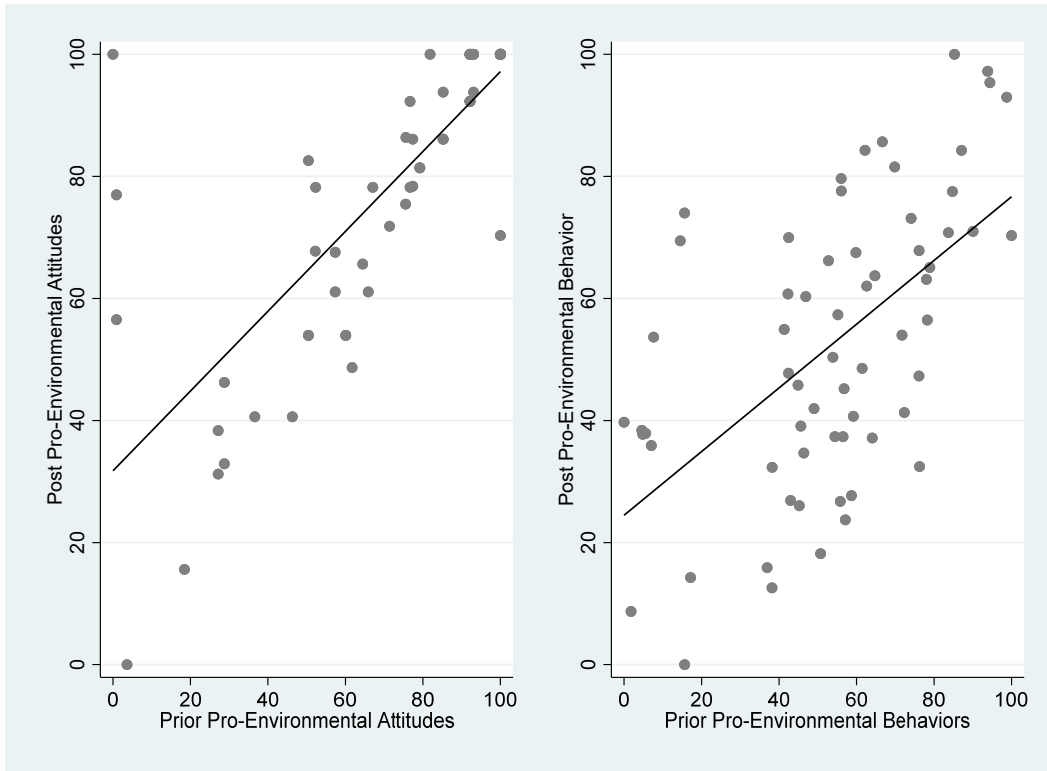


Figure 5. Scatterplot of Prior and Post Pro-Environmental Attitudes and Behaviors

Figure 5 presents two scatterplots that show the linear relationship between prior and post pro-environmental attitudes and behaviors. Figure 5 shows residents with higher levels of prior attitudes and behaviors equally exhibit higher levels of post attitudes and behaviors. The correlation coefficient between prior and post attitudes was observed to be .78. While the correlation coefficient between prior and post behaviors was .58. The scatterplot of pro-environmental attitudes also further reinforces the fact that tiny house enthusiasts moving into tiny house communities already hold high levels of pro-environmental attitudes.

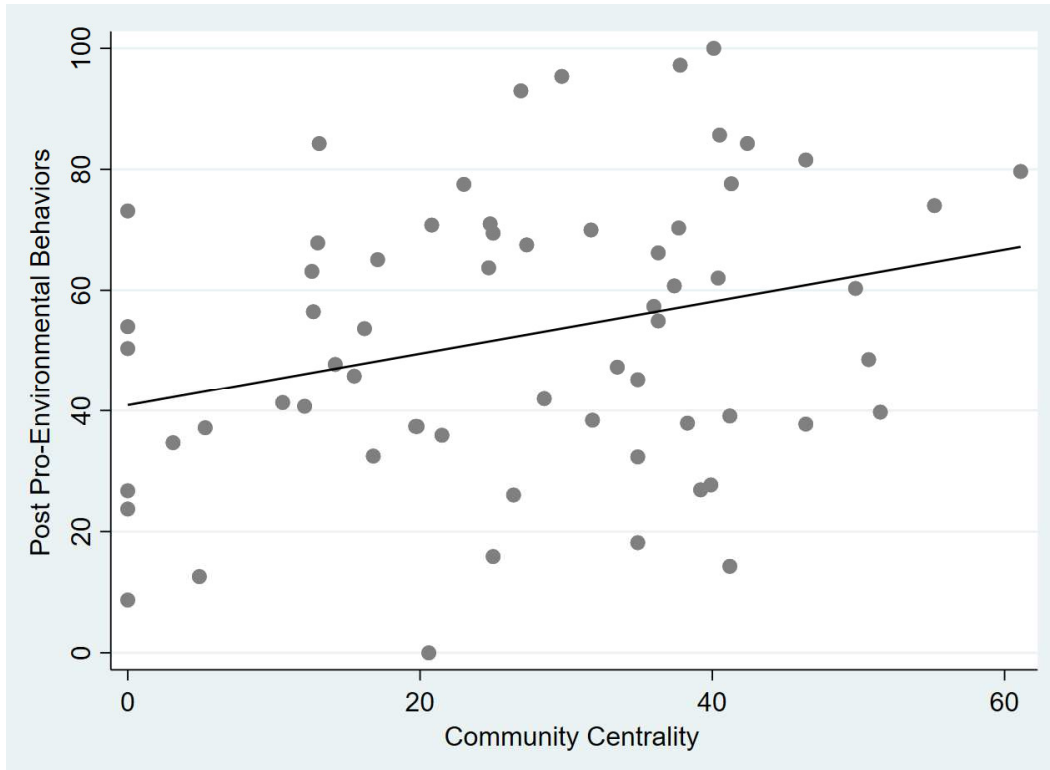


Figure 6. Scatterplot of Post Pro-Environmental Behaviors and Community Centrality

Figure 6 presents a scatterplot illustrating the linear relationship between community centrality and post-pro environmental behaviors. The correlation between community centrality and post pro-environmental behaviors was .28. From this figure it is shown that the relationship between community centrality and post pro-environmental behaviors is linear and positive. This positive linear relationship is important as it means that as community centrality increases so do the overall levels of pro-environmental behaviors. Thus, the scatterplot provides initial evidence supporting H₂ in that that community integration has a positive effect of pro-environmental behaviors of tiny house enthusiasts who reside in a tiny house community.

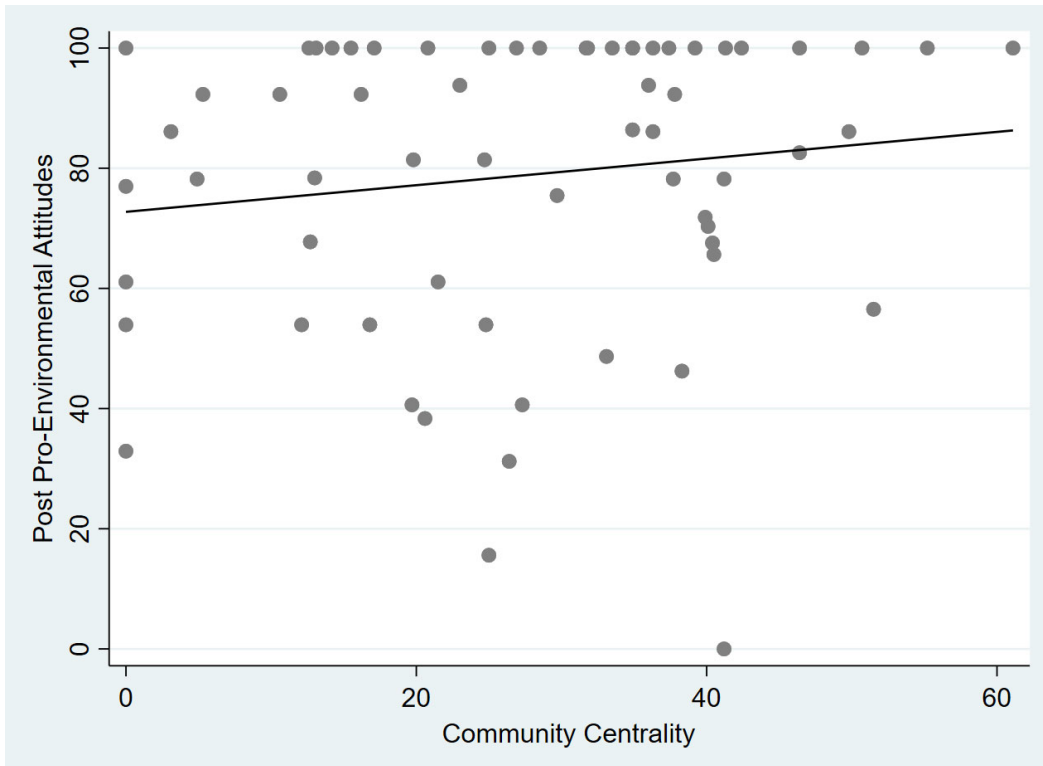


Figure 7. Scatterplot of Post Pro-Environmental Attitudes and Community Centrality

Figure 7 presents a scatterplot illustrating the linear relationship between community centrality and post pro-environmental attitudes. The correlation between community centrality and post pro-environmental attitudes was .13. The scatterplot confirms that the relationship between post pro-environmental attitudes is indeed positive and linear. More importantly the figure further demonstrates how levels of pro-environmental attitudes are equally high in post as they are prior to joining a community. Figure 7 also helps illustrate the tendency for pro-environmental attitudes to be skewed towards the top end of scale.

Table 8. Models of Post Pro-Environmental Behaviors

	1	2	3
<i>Variable</i>			
Prior Pro-Environmental Behavior	0.522*** (0.0935)	0.571*** (0.0848)	0.556*** (0.0717)
Community Centrality		0.569*** (0.142)	0.384*** (0.143)
Christian			-7.402** (4.258)
Community Impact			0.343*** (0.0887)
Age			-0.349*** (0.130)
Community Attachment			0.0908 (0.0915)
Constant	24.46*** (5.566)	6.551 (6.714)	2.738 (8.938)
Observations	64	64	61
R-squared	0.334	0.472	0.681

Note: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 8 presents estimates from the multivariate OLS regression models of pro-environmental behaviors. Model 1 presents the effect of controlling for the respondent's levels of pro-environmental behaviors prior to joining the community. As shown in Figure 5, I find a positive association between pre- and post-environmental behavior. Specifically, I find prior pro-environmental behavior explains 33.4 percent of the variance in post-environmental behavior.

Model 2 introduces the first of the main independent variables: community centrality. The model shows a positive and significant association between centrality and post pro-environmental behaviors. Specifically, a point increase in community centrality is associated with a .57 increase in post pro-environmental behaviors. I find centrality improves the fit of the model. Specifically, centrality accounts for about 14 percent of the variance in behavior.

Model 3 adds the rest of the independent variables such as Christian, community impact, age, and community attachment. I find the coefficient for community centrality slightly decreases but remains significant when controlling for Christian, community impact and age. According to

Model 3, community impact and age are significant predictors of post pro-environmental behaviors. Here it is important to point out that both Christian and age exhibit a significantly negative relationship with post pro-environmental behaviors. On average, Christian respondents score 9 points lower on post pro-environmental behaviors compared to non-Christian respondents. For each additional year in age, the respondent's score decreases by .35 in post pro-environmental behaviors. Post pro-environmental behaviors increase by .34 for a point increase in community impact.

The inclusion of the other covariates in Model 3 increases the R-squared to .68. This shows that the covariates in Model 3 explain almost 70% of the variance in post environmental behavior observed in the sample. It is important to note, however, that the 4 additional variables in Model 3 only explain an additional 21% of the variance compared to Model 2. Overall, the estimates in Model 3 provide further support for H₂ in that community integration exhibits a significantly positive relationship with pro-environmental behaviors. There was no evidence to support H₃ as community attachment was not found to be a significant predictor of pro-environmental behaviors.

Table 9. Models of Post Pro-Environmental Attitudes

<i>Variable</i>	1	2	3
Prior Pro-Environmental Attitudes	0.654*** (0.0667)	0.649*** (0.0668)	0.583*** (0.0682)
Community Centrality		0.139 (0.128)	0.165 (0.165)
Christian			-7.725 (4.525)
Community Impact			0.119 (0.0932)
Age			-0.213* (0.134)
Community Attachment			-0.0439 (0.0964)
Constant	31.76*** (5.170)	28.31*** (6.068)	40.38*** (9.669)
Observations	64	64	61
R-squared	0.608	0.615	0.669

Note: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 9 presents findings from the OLS regression models for post pro-environmental attitudes. Model 1 observes the effect of pro-environmental attitudes prior to joining a community. Based on the model, prior attitudes are positively associated with post attitudes. More importantly, I find prior pro-environmental attitudes account for 61 percent of the variance in post environmental attitudes based on the R-squared. This is important as it shows how the majority of the variance in post pro-environmental attitudes is explained by prior attitudes. As shown in Figure 7 and the previous chapter, tiny house enthusiasts were already highly environmentally motivated prior to joining a tiny house community.

Model 2 introduces the first of the main independent variables: community centrality. Based on Model 2, I find a positive, but not significant association between community centrality and environmental attitudes.

In Model 3, I find age as a marginally significant predictor of post pro-environmental attitudes. However, unlike model 3 on pro-environmental behaviors, the addition of age,

community attachment, Christian, and community impact have only a slight impact on the overall variance explained. The R-squared value increases marginally from for 0.615 to 0.669.

This provides further evidence for the fact that tiny house enthusiasts already hold high levels of pro-environmental attitudes prior to joining the community as almost all the sample variance is explained by prior pro-environmental attitudes. Prior attitudes account for roughly 61% of the overall variance and the addition of the other independent variables only raises this to about 67%. Model 3 unfortunately finds that living in a tiny house community does not significantly affect pro-environmental attitudes, thereby there is no evidence to support H₂ or H₃. Furthermore, this means that community integration and community attachment only exhibit an insignificant effect on pro-environmental attitudes.

Robustness Checks

To confirm the main results of this study I performed a series of robustness checks. An initial concern in the study was the potential for the effect of centrality being conditioned by prior behavior and attitudes. This was mainly due to the fact that tiny house enthusiasts were potentially already highly environmentalist in regard to pro-environmental behaviors and attitudes. Furthermore, it could also be that once these residents with high levels of environmentalism join a community, they might become highly central within these tiny house community networks. I therefore conducted a series of regression models testing for the interaction between prior behaviors and attitudes and community centrality.

Table 10. Interaction Effects Models of Post Pro-Environmental Behaviors

<i>Variable</i>	1	2
Prior Behavior * Community Centrality	-0.00222 (0.00590)	-0.00272 (0.00492)
Prior Pro-Environmental Behaviors	0.634*** (0.188)	0.641*** (0.158)
Community Centrality	0.680** (0.329)	0.556** (0.277)
Christian	-	-6.665* (4.241)
Community Impact	-	0.379*** (0.0834)
Age	-	-0.340** (0.131)
Constant	3.258 (11.07)	.555 (11.72)
Observations	64	61
R-squared	0.474	0.677

Note: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 10 presents the interaction effects regression models for post pro-environmental behaviors. The coefficient presented for the interaction effect between prior behaviors and community centrality is the multiplicative of the two variables interacted together. Model 1 finds that the interaction effect is insignificant and small. Model 2 further confirms this by also finding that the interaction effect is insignificant and small when accounting for other covariates. This is important as it demonstrates that the effect of community centrality on post pro-environmental behaviors is not contingent on levels of prior pro-environmental behaviors.

Table 11. Interaction Effects Models of Post Pro-environmental Attitudes

<i>Variable</i>	1	2
Prior Attitudes * Community Centrality	-0.00568 (0.00375)	-0.00359 (0.00393)
Prior Pro-Environmental Attitudes	0.824*** (0.133)	0.698*** (0.143)
Community Centrality	0.502* (0.272)	0.360 (0.279)
Christian		-6.968 (4.596)
Community Impact		0.118 (0.0880)
Age		-0.199 (0.135)
Constant	17.15* (9.508)	30.08** (13.65)
Observations	64	61
R-squared	0.629	0.673

Note: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 11 presents the models of the interaction effect between prior pro-environmental attitudes and community centrality. Model 1 finds that the interaction effect is insignificant between prior attitudes and community centrality. Model 2 further confirms this by also finding that the interaction effect is not significant when accounting for other covariates. Like in the case of behaviors, the lack of an interaction effect between prior attitudes and community centrality indicate that the effect of community centrality is not contingent on prior attitudes. Thus, further adding to the robustness of the overall findings of the study.

In addition, I also checked for evidence of multicollinearity³ by examining the variance inflation factor (VIF) for each variable in the regression models. The variance inflation factor is one way to examine both the existence and degree of multicollinearity present within the variables of a regression model. The VIF specifically refers to the degree to which the variance of sample

³ Multicollinearity was measured using the “collin” command within STATA 16.

increases as a result of “collinear independent variables” or variables which are highly correlated with one another (Craney and Surles 2002). While there is not set statistical cutoff for the VIF score, a score above 2.5 has been commonly viewed as a sign of multicollinearity (Allison 1999). The higher the VIF, the higher the potential for inflated standard errors as result. A high VIF is also problematic in that it increases the chances of committing a Type 2 error in which the null hypothesis is falsely accepted. Examining for multicollinearity in this way also helps identify variables that might need to be removed or run in a separate regression so as to not bias the regression coefficients. Thereby, this study checked for multicollinearity among all measured variables collected in the study which included tiny house square footage, household size, community centrality, income, Christian, female, age, community attachment, post pro-environmental attitudes, post pro-environmental behaviors, education level, community impact, full-time employment, race, months lived at community, length of tiny house interest. The test for multicollinearity yielded a mean VIF of 1.73, with no scores above 2.5.

In addition to checking for multicollinearity, I also tested for heteroskedasticity⁴. Heteroskedasticity was tested for by using the Breusch-Pagan test. The Breusch-Pagan test essentially examines whether the all of the “error variances are all equal” to indicate homoscedasticity (Sajwan and Chetty 2018). This test was run using all of the independent variables used in the regression models. None of the independent or dependent variables showed signs of heteroskedasticity. Further robustness checks were conducted in the form of both univariate and multivariate outlier tests.

Univariate outliers were measured by generating box plots within STATA 16 of the independent variables used in the study. Univariate outliers were only detected within post pro-

⁴ Heteroskedasticity was measured by using the “estat hettest” command within STATA 16.

environmental attitudes and community impact. A test for multivariate outliers was conducted using the bacon test within STATA 16. Using the bacon test, no multivariate outliers were detected.

Table 12. Robust Regression Models of Post Pro-Environmental Behaviors

	1	2	3
<i>Variable</i>			
Prior Pro-Environmental Behavior	0.530*** (0.101)	0.595*** (0.0907)	0.545*** (0.0733)
Community Centrality		0.603*** (0.152)	0.351** (0.146)
Christian			-5.182 (4.353)
Community Impact			0.347*** (0.0907)
Age			-0.442*** (0.133)
Community Attachment			0.113 (0.0935)
Constant	23.97*** (6.036)	4.574 (7.179)	6.284 (9.136)
Observations	64	64	61
R-squared	0.306	0.462	0.675

Note: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

In order to further test the potential sensitivity of the findings to the above identified outliers, I ran robust regression models on both post pro-environmental behaviors and attitudes. Table 12 presents the results of the robust regression run on post pro-environmental behaviors. Model 1 recreates the model specification used in Model 1 of Table 8 which measures the effect of prior pro-environmental behavior on post pro-environmental behavior. Model 1 of the robust regression presents findings in line with Model 1 of the Table 8.

Model 2 replicates the model specification used in Model 2 of Table 8. Model 2 presents findings in line with Model 2 of Table 8. Model 3 replicates the model specification used in Model 3 of Table 8, also finds that prior behavior, community centrality, community impact, and age are significant predictors of post pro-environmental behaviors. The only noticeable difference from the OLS regression on post pro-environmental behaviors is that Christian is no longer significant.

Thereby it can be said that in the case of post pro-environmental behaviors, the findings are overall robust. This also solidifies findings and further solidifies support for H₁, H₂, and H₃.

Table 13. Robust Regression Models of Post Pro-Environmental Attitudes

	1	2	3
<i>Variable</i>			
Prior Pro-Environmental Attitudes	0.940*** (0.0101)	0.947*** (0.0265)	0.957*** (0.0293)
Community Centrality		0.0216 (0.0496)	0.0525 (0.0638)
Christian			-1.595 (1.855)
Community Impact			0.0531 (0.0370)
Age			-0.0579 (0.0528)
Community Attachment			-0.0595 (0.0384)
Constant	6.327*** (0.789)	5.835** (2.294)	8.530** (3.870)
Observations	63	63	60
R-squared	0.993	0.956	0.962

Note: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

I also ran a robust regression models on post pro-environmental attitudes. Table 13 presents the results of the robust regression run on post pro-environmental attitudes. Model 1 recreates the model specification used in Model 1 of Table 9 which measures the effect of prior pro-environmental behavior on post pro-environmental behavior. Like in Model 1 of Table 9, prior attitudes are a significant predictor.

Model 2 replicates the model specification used in Model 2 of Table 9. Model 2 presents findings in line with Model 2 of Table 9 in finding significance with prior attitudes and not community centrality. Model 3 replicates the model specification used in Model 3 of Table 9, and also finds that prior attitudes remain significant, but age is no longer significant. It should be noted that age was only slightly significant to begin with. Overall, it can be said in the case of post pro-

environmental attitudes, the findings are robust. With regard to pro-environmental attitudes, the robust regression further solidifies the lack of evidence to support H₁, H₂, and H₃.

Conclusion

Overall, I find that community centrality is positively associated with post pro-environmental behaviors even in the case of controlling for prior behaviors, community attachment, community impact, age, and Christian. This finding demonstrates the importance of community integration in the promotion of sustainable lifestyles and communities in the form of tiny house communities. Findings on the difference in pre and post attitudes and behaviors found partial support for H₁ in that pro-environmental attitudes rose after joining a community whereas behaviors did not. The findings on post pro-environmental behaviors did however provide support for H₂ in the community integration exhibits a positive and significant relationship with pro-environmental behaviors. Findings on post pro-environmental attitudes present a different picture in that no support was found for H₃.

CHAPTER 6. CONCLUSION

The last five years on earth have been the hottest on record and therefore now is the time to tackle the issue of climate change (Milman 2020). Skyrocketing global temperatures resulting from the industrial revolution and more recently, economic globalization have led to experts in search of solutions, calling for drastic changes, going so far as to assert that we are 10 years away from ‘runaway’ global warming territory (Neslen 2018). Dietz and Colleagues (2020) explicitly questioned “[w]hat are the possibilities for reducing risk through reform and the potential for accomplishing more substantial societal transformation towards sustainability?” (150). As this thesis has argued, one solution is to promote the social development of tiny house communities.

The tiny house movement literature has focused primarily on understanding the motivations behind people’s choice to ‘go tiny’ (Boeckermann et al. 2019; Mutter 2013; Summers 2021). Tiny house enthusiasts are motivated by interests in ‘living with less’, ‘living debt free’, and most pertinent to this study, reducing their impact on the planet. This often came in the form of an interest in environmentalism or pro-environmental behaviors and attitudes lingering within themes of simple living and environmental sustainability (Boeckermann et al. 2019; Böllert 2019; Mangold and Zschau 2019; Mutter 2013; Ritzer 2003; Saxton 2019; Summers 2021). While environmental considerations were cited as motivational by some, little to no research explored how these considerations play out within a tiny house community, and more importantly whether a community context amplified these environmental considerations. The literature is therefore sorely missing discussion of the potentially pro-environmental nature of tiny house communities around the US and the world. This is surprising given that tiny houses exhibit a lower carbon footprint and utilize fewer resources to heat and cool (Carlin 2014; Crawford and Stephan 2020; Mukhopadhyay 2020). Tiny houses could also potentially incentivize the formation of smaller

families, further reducing a resident's carbon footprint, this however remains to be tested. Knowing this, it only makes sense to view a community of tiny houses as a sustainable housing solution to the dire climate crisis.

In addition to the general lack of research into tiny house communities as a potential climate change solution, no research has addressed the role of community integration and place attachment within these communities. Therefore, the goals of this study were to address how living in a tiny home community might affect levels of pro-environmental behaviors and attitudes by examining the effects of community integration and attachment among residents. While it has been found that community integration and attachment (Buta et al. 2014; Daryanto and Song 2021; Halpenny 2010; Pei 2019; Rokicka 2002; Walker and Chapman 2003) act as important predictors of pro-environmental behaviors and attitudes in other contexts, the effects on tiny house enthusiasts living in community have yet to be studied.

I find that tiny house enthusiasts were deeply motivated by an interest in sustainability, encapsulated with ideas of simple living. Tiny house enthusiasts further illustrated their environmentalism with their engagement in pro-environmental behaviors like living with less or being more eco-friendly. In addition, I also find that tiny house enthusiasts draw philosophical inspiration from philosophies which echo environmentalist tenets such as environmentalism, voluntary simplicity, and minimalism.

This study demonstrated that community integration increases pro-environmental behaviors, but not attitudes for tiny house community residents. This increase in behaviors could be a result of being surrounded by others engaging in these behaviors, thereby exhibiting a kind of synergistic effect on one another's levels of pro-environmental behaviors. This synergy of being surrounded by likeminded others led to an increase in the prevalence of pro-environmental

behaviors within tiny house communities. Community impact was also found to increase pro-environmental behaviors. While both age and being Christian were found to decrease pro-environmental behaviors.

Community attachment surprisingly led to a decrease in pro-environmental attitudes, but the effect was not significant. Similar to behaviors, an increase in age also led to a decrease in the level of pro-environmental attitudes, with only marginal significance, which was eliminated through conducting a robust regression. Community integration was also found to increase pro-environmental attitudes however the effect is not significant. Therefore, it can be said that community integration is key to increased levels of pro-environmental behaviors, but not attitudes. Community attachment was found to not be significant in terms of behaviors or attitudes. Thus, findings on community integration are in line with findings on social capital from the literature, whereas findings on community attachment were not. It is also important to note that tiny house enthusiasts already exhibited high levels of pro-environmental attitudes prior to moving into a community, making it potentially much more difficult to find a significant effect from community integration or community attachment.

While this study contributes greatly to our understanding of tiny house communities, specifically in regard to pro-environmental behaviors and attitudes it is also important to note some limitations. First, the study sample was small and temporally limited. Findings were based on a small sample of 10 tiny house communities, with a total of 64 responses. In addition, respondents were only surveyed at one point in time and were not asked repeatedly over time to track their pro-environmental attitudes and behaviors. Future research should aim to sample a larger subset of tiny house communities in range of 15-20 and aim for an $n = 300$. Future research should also take a longitudinal approach and sample communities at 6 month intervals for at least a year.

Second, this study measured community integration through only one question limiting the overall measurement of this concept. Future research should expand on the measurement of community integration by expanding the scope of network related questions to include outside organizations as well. This would allow for a better understanding of the bridging and linking capital that is at play in these communities.

Third, this study lacked any kind of field observational data. Future research should utilize a participant observation approach in conjunction with semi-structured interviews with tiny house enthusiasts to get a deeper grasp on both where and how their pro-environmental attitudes and behaviors come to be. This approach would also allow for a better understanding of exactly how new pro-environmental behaviors and attitudes might be introduced into the community from outside sources.

Overall, this study has contributed to an increased understanding of the environmentalist tenets of tiny house enthusiasts and tiny house communities by illustrating the role of community integration and community attachment in fostering pro-environmental behaviors and attitudes. This study increased our understanding of how intentional communities such as tiny house communities could act as a potential sustainable housing solution to climate change. This study also confirmed prior findings regarding environmental concern specifically in that age is significant predictor. It was also reaffirmed that community integration is a key player in participant levels of pro-environmental behaviors. In addition, this study also provided evidence to support the assertion for tiny house communities to be viewed as an American third wave of the cohousing movement. Furthermore, this study aimed to spur further research into the environmentalist tenets of tiny house living. Accordingly, tiny house communities can be viewed

as one solution to the question originally posed by Dietz and colleagues, and more importantly to the issue of climate change.

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APPENDIX

Appendix A. Community Contact Script

Hey **{Name of Community Contact}**,

My name is Severin Mangold and I am a graduate student in the Sociology department at Colorado State University. I am conducting research on tiny house communities around the country and their potential impact on the people that live in them, specifically their engagement of environmentally friendly attitudes and behaviors. I came across **{Insert Name of Community}** and thought that your community would be a great addition to my project. To participate all that I would need is for someone from the community to send out the link to my online survey to the community residents, participation is completely voluntary. I would greatly appreciate the possibility for **{Insert Name of Community}** to be part of my research. I would also be willing to share the results of my study upon completion. I would also be more than happy to set up a phone call to discuss the specifics or any questions you may have. I can be reached at XXX -XXX-XXXX. I look forward to hearing from you!
