Exploring the Development of Gardening Identity in College Students: Project "Aggies Grow Veggies" at UC Davis

By

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Abstract

As food insecurity affects 42% of students across UC campuses, the UC administration has launched various food and housing security initiatives. Among these are programs to encourage vegetable gardening in students. However, as knowledge-driven strategies are sometimes limited in creating long-lasting behavior change, this study seeks to better understand, through the lens of identity development, the complex matrix of social- and cultural-factors that affect gardening interest.

This research followed 14 of the 20 UC Davis college students in a 6-week virtual gardening workshop series. All participants attended weekly workshops and received free kits and mentorship to garden from home. This mixed-method research included surveys, interviews, and workshop assignments geared to understand how various identity resources mediate students' gardening identities and how gardening connects with other personal identities.

Findings highlight the importance of relational resources as gateways for greater access and utilization of material and ideational resources. The network of identity resources makes practice-linked identities available to participants through the dialogic, self-other relations embedded in active participation. This study suggests that effective gardening and nutrition education programs will foster interaction among gardening and individuals' varied sociocultural identities and interests. Further studies can build on this research to evaluate the impacts of gardening identity on their long-term gardening practice, food literacy, and overall health.

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Acknowledgments

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gave me life and demonstrated his unconditional love through Jesus Christ, so that I can share in a personal, loving relationship with Him and learn to love those around me.

In a world where the majority of our learning, thinking, and knowing are socially and culturally constructed, our various identities are constantly in oscillation and conflict, being defined and re-defined in relation with ourselves and one another. Yet, I believe that our truest, most steadfast aspects of our identity will never be fully understood without knowing our Creator. In creating us in his image, God imparts to us our unchanging worth that is infinitely precious and significant, and I know that beneath all my other identities, my core identity as a beloved daughter of God is the one that will never change.

To me, the garden is a special place because that is where God once placed the first humans to dwell in shalom (*Hebrew for flourishing peace and harmony*) with Him and all of His creation. Perhaps gardening and connecting with nature can be so peaceful and restorative as a practice, precisely because we as humans are able to connect in dialogic relationship with an "Other" that is beyond ourselves, not only with the plants, people, and other living and nonliving things in this planet, but also with the God who dwells within and outside this world that He has called into being. It is in the garden, where seeds once living die and multiply, where I am at peace, knowing, "*that I am not my own, but belong with body and soul, both in life and in death, to my faithful Savior Jesus Christ" (Ursinus, 2012).*[1]

[1] Quoted from The Heidelberg Catechism, originally published in 1563.

Introduction to the Research Project

Moving to Davis as a Los Angeles-native graduate student, I looked forward to immersing myself in the myriad of opportunities in sustainable agriculture and garden education, fully utilizing the city-wide composting facilities, and volunteering in the community's food access and agricultural programs. On our first visit to University of California, Davis in April 2019, my parents and I toured the green expanses of the campus lawns with numerous flower and vegetable gardens and trees lining the bike lane-ladened town. The highlight was visiting the 23-acre Student Farm that grew an array of plants and fruit trees, a teaching vineyard, chickens, native and pollinator flowers, medicinal and kitchen herbs, and rows of produce for its local CSA program and the Dining Commons - also while cultivating student interns and lead student farmers through various educational programs. That was the first sense of community I experienced at Davis: one of biodiversity, beauty in nature, and people flourishing within this ecosystem.

What was so special about visiting this Ecological Garden at the Student Farm was not just the beautiful landscape that I beheld in that moment. It was the recollection of past gardening memories with elementary students I once worked with, imagining them with me planting in the same raised beds or weeding along the same, woodchip-mulched paths, exclaiming over colorful flowers and ladybugs, or being fascinated by the aromatic, flavorful fennel, chocolate mint, and lavender. It was engaging with a staff member and other student farmers about recent endeavors and current opportunities for getting involved, or perhaps seeing my parents witness with novelty the many miracles that daily grace a garden ecosystem, that filled me with particular joy. And it was the existence of this learning garden that affirmed my future aspirations, my desires to reconnect humans with humus through gardening and bridge the gap between us as consumers and the soil where our food comes from. Within this

one space, the people, plants, memories and conversations I shared led me to attach significance to and reinforced my desire to cultivate an identity rooted in this place and community.

Within any ecosystem, there is constant room for growth and development of relationships to build stronger connections, more efficient circuits, or more resilient systems. As I grew in awareness about the challenges surrounding our food system and development efforts to address poverty and food insecurity through my International Agricultural Development (IAD) classes, I delved into literature on global grassroots movements seeking food sovereignty and more biodiverse, equitable, and sustainable food systems. However, while food sovereignty was of great personal interest, the topic seemed too challenging or avant-garde to study for a master's degree, so I chose to center my thesis research on a smaller-scale intervention in a local setting: our UC Davis student community. After learning that food and housing insecurity are experienced by thousands of college students at this campus alone, I probed into some of the root causes and explored which I could actually study or impact. For many college students, a healthy diet is often inaccessible due to lack of time and money. The Student Farm Fresh Focus program and the Pantry (a food bank on the UC Davis campus) have played significant roles in expanding the food access network, but still, there was room for growth with awareness and utilization of these resources. At UC Davis, how could we build up more participation from the diversity of students and deepen collective awareness and advocacy for greater food access on campus and in our larger community?

In the summer of 2020, I worked with another undergraduate student and staff member to launch a TGIF grant[2]-funded project, called *Aggies Grow Veggies*. Our mission was to make gardening more accessible, affordable, and appealing for students at UC Davis, especially to those from lower-income backgrounds, first-generation students, or students of color. By

[2] Learn more about The Green Initiative Fund, a campus program hosted by UC Davis Sustainability, at https://tgif.ucdavis.edu/about

offering free gardening workshops, a media campaign curated for students, and additional tools and resources, Aggies Grow Veggies[3] aimed to build a more inclusive community of student gardeners, one that is welcoming and supportive of gardeners of all backgrounds and levels of experience. One further outcome I envisioned for this project was that, through this workshop experience, students would be equipped with life-long skills for greater food access, awareness of the network of resources around them, and critical knowledge and experiences to make healthy choices for themselves, their community, and surrounding ecosystem.

While this intervention forms the background setting of this research paper, my thesis research was primarily focused on the gardening workshops component of the Aggies Grow Veggies project. Conducted alongside the program evaluation of the gardening workshop series, this research study implemented sociocultural learning perspectives to assess the overall learning experience and its impact on students' lifestyles and choices surrounding gardening and food. Because food choices involve a complex matrix of social, cultural, and economic factors (Cairns & Johnston, 2018), knowledge-driven strategies and assessments can sometimes be limited in predicting individuals' food choice or food access. Given that identity development may be a more meaningful indicator of learning and longer-term behavior adoption, this study explored how the availability of various identity resources influenced the students' learning and mediated the development of students' "gardening identity" over the course of these workshops.

Aside from focusing on identity resources, my research is centered on the relationship between gardening identity development and other behavioral changes related to food choice or gardening. However, given the time limitations with this 6-week series, as well as some college students' disinclination to affiliate with a strict identity label, the concept of practice-linked identities provides an alternative route to exploring the values and identities that students come

[3] Find the various social media platforms for Project Aggies Grow Veggies at https://linktr.ee/aggiesgrowveggies.

to take on and embody. As college is a crucial period of self-discovery and coming of age for undergraduate students, how do these developing identities intersect with their other personal identities that students bring to these experiences? These are some of the main questions I explore in this research study.

Literature Review

Background of the Problem

Food insecurity in the United States and American Universities

Even as a highly industrialized, "developed" nation, the United States has a stark socioeconomic divide, as the top 1% of society share about 33% of the nationwide wealth (Zucman, 2019). For the bottom 75% in our society (with just 10% of the share in wealth), access to fresh, nutritious food is limited or out-of-budget, leaving families to subsist on diets mainly characterized by processed, unhealthy, conventional commodities. According to USDA estimates, one out of every seven households in the United States is considered food insecure (Martinez, Maynard, & Ritchie, 2016). However, overlooked in these national-level household studies are college students, many of whom are living independently for the first time and face higher risk of food insecurity relative to the general population (Micevski, Thornton, and Brockington, 2014; Camelo & Elliot, 2019; Martinez et al., 2019).

Defining Food Insecurity

Food insecurity is defined as "the inability to access and procure, through conventional avenues, nutritionally adequate foods capable of supporting an active and healthy lifestyle" (Micevski et al., 2014, p. 258). Forty percent of students are affected by this phenomenon, according to a recent review of hunger studies at U.S. colleges (Martinez et al., 2019). Faced with student debt and busy work-study schedules, food-insecure students struggle with decreased energy and motivation to dedicate to their studies, higher body mass index (BMI) and poorer health, and lower academic performance (Camelo & Elliot, 2019; Martinez et al., 2019; Weaver et al., 2019). Because these financial struggles reflect the greater socioeconomic inequality within our society today, youth from historically marginalized ethnic groups are more

vulnerable to experiencing food insecurity, further widening the gap in student academic achievement, overall health, and future success (Camelo & Elliot, 2019, Martinez et al., 2016).

UC Davis' Response to Food Insecurity

Within the University of California (UC) system, food insecurity affects 42% of its 250,000 students, as reported by a 2015 study commissioned by the UC Global Health Initiative, a UC system-wide initiative to advance global health research, education, and collaboration in California and worldwide (Martinez et al., 2016; Coyne, 2018). Based on 2010 and 2013 surveys, where 11% of UC undergraduate students responded "somewhat often" and 14% responded "often/very often" to skipping meals in order to save money, campuses across the UC system launched independent efforts to support students in need of food from 2010 to 2014 (Galarneau et al., (n.d.)). In 2014, the University of California also launched the UC Global Food Initiative to build on existing food access networks and execute survey analyses to better understand and address food insecurity (Martinez et al., 2016).

Among the ten UC campuses, UC Davis has also undertaken focus group studies and a needs-based assessment to identify barriers to food security (Martinez et al., 2016; Steinberg et al., 2018). With the creation and hiring of a new, full-time career staff position in early 2018, the Director of Aggie Compass Basic Needs Center was able to spearhead efforts around food, housing, mental health, and financial wellness. In May 2018, the Associated Students of University of California, Davis (ASUCD) allocated a brick-and-mortar space dedicated to their student and career staff advisors. Through the collaboration among ASUCD, Aggie Compass, and the Center of Student Affairs Assessment (CSAA), this center was able to host its first programs (marked by an asterisk below) and offer a number of resources, listed below (Ryan Choi (2020-21 Pantry Director), personal communication, February 24, 2022).

- **The Pantry**[4] – an organization within ASUCD (The Associated Students of the University of California, Davis) that offers all UC Davis students a wide variety of fresh groceries and basic necessities at no cost to mitigate crisis and short-term food insecurity, referring students in greater need to the Basic Needs Center. [5]
- **Fruit & Veggie Up*** – providing students with free fresh produce from the UC Davis Student Farm, Tandem Farms, and perishable goods like eggs, milk, and pastries as part of food recovery efforts at local grocery stores
- **CalFresh**[6] **Enrollment Program*** – featured an in-house county CalFresh case manager who helped students complete a pre-screen to check for potential eligibility, and to help navigate through the initial application or appeal process
- **UC Davis Farmers' Market** [7] – with vendors from UC Davis Student Farm, farms and stores; even accepts CalFresh
- **Cooking Classes** at the Teaching Kitchen, offered through UC Davis Student Health & Counseling Services and coordinating active efforts on social media
- **Free community meals** offered by churches, food banks, nonprofits and local community efforts, including the **Davis Night Market** (reducing post-consumer food waste and sharing excess meals with the community) and the **Freedges** (community-stocked and utilized fridges) around town[8]

[4] https://thepantry.ucdavis.edu/
[5] When campus shut down through COVID-19 and wildfires, the Pantry expanded its services to offer a contact-free online ordering and pick-up system via indoor and outdoor venues to provide students with continuous access to fresh groceries and basic necessities, like diapers and menstrual products.
[6] CalFresh, also known as SNAP/EBT, is a long-term food assistance program for people with low-income and who meet federal income eligibility rules. Each month, qualifying students receive an Electronic Benefits Transfer (EBT) card to purchase groceries at eligible stores and locations.
[7] Closed operations during COVID-19, and resumed in fall of 2021
[8] Due to the COVID-19 pandemic and shutdown of in-person classes, the university has been forced to curtail some operations, while significantly expanding others, including the Pantry and Fruit & Veggie Up (grocery bag pick-ups), CalFresh (phone lines), and UCD Teaching Kitchen (on social media).

Within the 5 years before COVID-19, amplification of these services had been popularly received by UC Davis students, with long queues for fresh produce and goods offered for free (Coyne, 2018; Steinberg et al., 2018). One key partner that made this immediate expansion possible is the UC Davis Student Farm, a 23-acre farm where "students create, explore, and maintain sustainable food systems" ("Our Student Farm", 2020). Various opportunities at the Student Farm enrich the student community with deep connections to the land and larger food system, through volunteer and internship opportunities at their Market Garden, Eco-Garden, and Fresh Focus programs. Presently, this last program, initiated by students in 2014, delivers weekly boxes of produce to various student groups and centers across campus, including the Educational Opportunity Program, Native American Academic Success Center, Cross Cultural Center, LGBTQIA+ Resource Center and the AB540 and Undocumented Student Center (Agricultural Sustainability Institute, n.d.).

Research on UC Davis Food Security

A former graduate student researcher, Marisa Coyne, conducted a qualitative assessment on Fresh Focus (FF) and the Community Table Project (CTP), the farm-based food access and community networking programs developed in 2016 by the UC Office of the President's campaign for food security. In her findings, Coyne (2018) noted the evident expansion of the FF program and cross-disciplinary connections between the Student Farm and other academic departments through CTP, which catalyzed new partnerships and creative discussions regarding the complex issue of food insecurity (Steinberg, 2018). However, while they were able to measure the increase in the quantity of produce distributed across campus, one limitation was the uncertainty of whether the produce was reaching the students in need (Coyne, 2018). Continued research is needed, and currently underway through the Good Food Initiative, to investigate the effectiveness of these food access services in aiding food-insecure students at UC Davis through a longer-term study and questionnaire.

In evaluating the efficacy of these distributions of free meals and affordable, healthy food, I am brought to consider the significance of this work to increase food access for diverse populations. Food access, according to food justice activists and scholars, is simply defined as "the ability to produce and consume healthy food" (Alkon & Agyeman, 2011, p. 8). Just as genuine food security does not arise in national food systems dependent entirely on import-based commodities, individuals who are largely unaware of where their food comes from are less able to make informed choices that would support their personal health and the health of their local food system (Smythe, 2014). In partnership with the Student Farm and Aggie Compass, I proposed a slightly different approach to addressing food insecurity, asking: What would it look like to challenge general conceptions of food access, normally viewed as the ability to *acquire and consume* any food, and equip students with food access re-envisioned as the ability to *produce and consume* one's own food (Alkon & Agyeman (2011)? Especially in light of the COVID-19 pandemic that has illuminated the vulnerability of global, industrial agricultural systems, reorienting from a needs-based approach to an asset-based community development approach could benefit college students with more preventative measures for greater resilience in our Davis community food system and beyond (Corbett & Fikkert, 2014). In this research study, I proposed an intervention that offers empowering strategies for more direct food access, greater self-sufficiency, and longer-term food security.

Intro to Project: Aggies Grow Veggies

Since their emergence in the 19th century, community gardens have provided a vital, independent food source for both urban and rural populations in various socio-economic contexts (Draper & Freedman, 2010; Carney et al., 2012). Participation in community gardens, along with urban farms, school gardens, and farm-to-school programs provide numerous benefits including reduced food insecurity, increased fruit and vegetable intake, physical & psychological health benefits, cultivation of family and community relationships, economic

development, and community empowerment (Draper & Freedman, 2010; Carney et al., 2012; Meenar & Hoover, 2012; Algert, Diekmann, Renvall, & Gray, 2016; Tharrey et al., 2019).

Given the benefits of gardening as an educational tool, source of fresh produce, and a vehicle for promoting both personal and environmental health, my research aimed to deepen the networks among the student organizations, food access initiatives, and campus resources that promote both individual food skills and community food security. Currently, the university's Student Farm already provides a space where students can develop deeper connections to the land and larger food system through experiential learning. I view the Student Farm as a great example of a *community of practice* – a group of people in a shared domain of interest who learn through participation in various activities and joint interactions to carry out their goal (Lave & Wenger, 1991). Through the varying levels of participation by student volunteers, interns, and employees, the Student Farm is able to perform much of its multifunctional capacities – teaching garden classes to children, cultivating organic crops for the campus dining facilities and local Community Supported Agriculture (CSA) subscription-based program, harvesting from vegetable beds to deliver to the campus food pantry, and developing seed varieties through the Student Collaborative Organic Plant Breeding Education (SCOPE) project. Thus, participants at the Student Farm may more easily access resources and knowledge for procurement of affordable and healthy produce, as compared to the rest of the UC Davis student population. Simultaneously, student interns and employees build the capacity for the UC Davis community to collectively achieve greater food security and a resilient local food system.

While the Student Farm is accessible and open to students of all backgrounds, one observation that other students and I made while working there was that the students involved with the Student Farm programming were largely from environmental-related areas of study (Student Farm Community Open Forum, personal communication, Jan 30, 2020). To engage

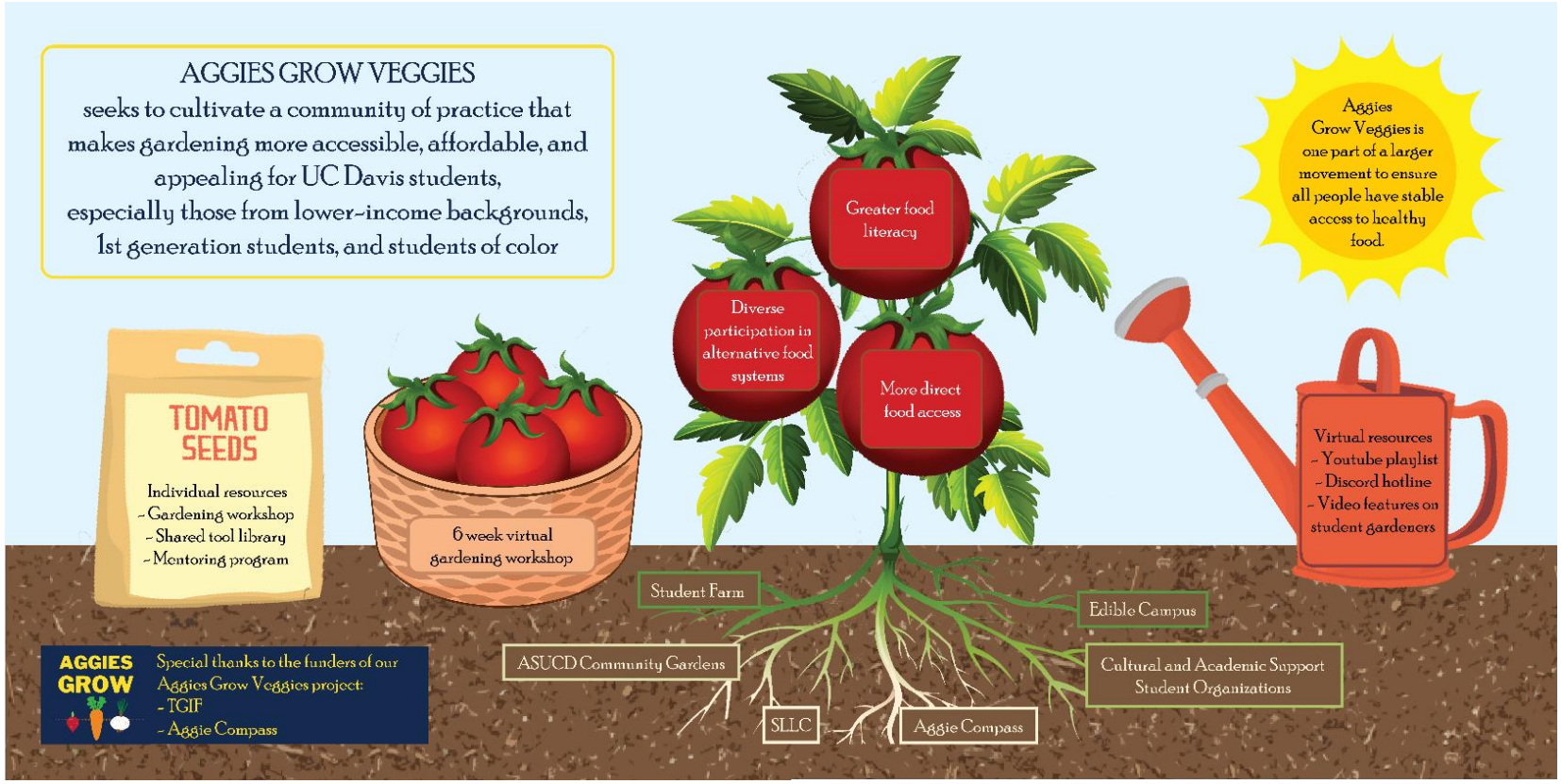
the wider, diverse body of college students with the benefits of food access and food literacy through agriculture, the project *Aggies Grow Veggies* emerged as an idea conceived by an undergraduate student and myself, in the winter of 2020, and was launched as an official project funded by The Green Initiative Funds (TGIF) grant from the university that summer. The project involved a multi-media campaign and gardening workshop series curated for students. Our mission statement was to "cultivate a community of practice that makes gardening more accessible, affordable, and appealing for UC Davis students, especially those from lower-income backgrounds, first-generation students, and students of color."

Presently, the Student Farm offers multiple volunteer and internship positions, and various additional opportunities to garden are available through residential gardens, on-campus edible landscapes, and horticultural internships at the university's arboretum. Even with these opportunities, there are various financial and physical barriers for students to get involved with gardening. By coordinating a multi-media resource campaign, free gardening workshops, and access to community garden plots and gardening tools, the *Aggies Grow Veggies* project aims to decrease the barriers to and increase more diverse student participation in community gardening. The desired objectives of this project are three-fold:

1. Increase students' direct food access, or the ability to grow one's own fresh, healthy produce,
2. Encourage more diverse student participation in alternative food systems at UC Davis, such as in backyard or on-campus gardens,
3. Strengthen students' food literacy, or knowledge to make healthy food choices that support their personal and environmental health.

Figure 1.

Aggies Grow Veggies Theory of Change diagram



Note: This Theory of Change diagram illustrates the components and objectives of the Aggies Grow Veggies project. Credit for the design of this diagram goes to: Sydney Procino.

Literature Review on Gardening & Identity

While Project *Aggies Grow Veggies* serves as the backdrop to the thesis, the gardening workshops component of this project will be the focus of my research. At the outset of this education and outreach-centered project, I envisioned studying food literacy gains and behavior changes associated with students who participate in the gardening workshops. As Garden-Based Learning (GBL) programs have grown in popularity across the continent, many of these environmental or nutrition education programs have sought to increase students' food literacy, an emergent concept to understand the social determinants of individual and collective health and equip consumers with crucial food skills, knowledge, and resources (Cullen et al., 2015; Renwick & Powell, 2019).

However, various challenges arose as I explored the literature on food literacy and sought to implement food literacy assessments in this project. First, multiple definitions were cited by numerous researchers and reviews, and the published surveys analyzing food literacy were generally more fixed on health literacy and individual food skills. By overlooking the foundational pillar of community food system awareness, these nascent, simplistic definitions of food literacy and dietary programs targeted at encouraging people to "make the right choice" risked the danger of implicitly blaming individuals for structural problems in food systems (Sumner, 2013). Recent papers have developed more comprehensive definitions of food literacy, like the one found in Cullen and colleagues' (2015) literature review, "Food Literacy: Definition and Framework for Action."

> *"**Food literacy is the ability of an individual to understand food in a way that they develop a positive relationship with it**, including food skills and practices across the lifespan in order to navigate, engage, and participate within a complex food system. It's the **ability to make decisions to support the achievement of personal health and a sustainable food system**, considering environmental, social, economic, cultural, and political components. (Cullen et al., 2015, p 143, emphasis added)*

Going beyond emphasizing the importance of an individual's knowledge of food and the food production system, Cullen et al. (2015) propose a framework that places food literacy at the juncture where community food security and individual's food skills intertwine (Figure 2).

Figure 2.

Food Literacy Framework for Action.

Fig. 1 Food Literacy Framework for Action shows food literacy as the juncture where community food security and individual food skills intertwine. An individual may be strong in food skills but their community may not be food secure; or a community may be food secure but individuals have few food skills. For an individual or population to be food literate and to fully engage in their food system, an ecological approach is necessary, in that individual behaviours and skills cannot be separated from their environmental or social context. It is theorized that increasing food literacy will lead to increased health and well-being.

Note: Reproduced from Cullen et al., (2015) with permission from co-authors W. Martin and J.F. Higgins.

Even after the complex task of settling on a working definition, a second challenge to implementing food literacy in this project was finding or developing a survey to measure food literacy. Various studies have developed agricultural literacy research methods (Kovar & Ball, 2013), but those assessments took a slightly different focus on food production and were not appropriate for our workshop outcomes. Though researchers had found food literacy to be one of the key mechanisms for organizing greater social transformation toward a more equitable and

resilient food system (Powell & Wittman, 2018), the practicality of implementing a concrete evaluation of food literacy changes was difficult as there were no published, pre-evaluated surveys available for our specific study population of college students.

Lastly, as with any program-based evaluation, quantitative studies tend to take the hallmark of demonstrating the significance of an intervention through performance- or knowledge-based indicators. However, as outlined by Bloom's Taxonomy (1956), learning does not solely dwell or manifest in the cognitive domain, but in the psychomotor and affective domains as well; for food systems-related education to be deeply meaningful, it must engage the learners' feelings, values, and motivations (Galt, Parr, & Jagannath, 2013). Because food literacy involves a framework of attitudes, skills, and knowledge, a more holistic approach is needed: "Knowledge clearly matters… but food choices occur within a complex matrix of social, cultural, and economic factors" (Cairns & Johnston, 2018, p. 569).

For this reason, research on environmental education has shifted to studying longer-lasting behavioral change through the lens of identity, a notion which has risen to prominence in general education research in the last decade (Urueta Ortiz, 2016). Studying the development of an environmental gardening identity, in particular, has been found as a more predictable and robust measure of behavior (Kiesling & Manning, 2010; McGuire, 2015). Stapleton (2015) conducted a study on a group of high school students and their identity development through a global education trip in Southeast Asia focusing on climate change and other environmental issues. Referencing critical sociocultural perspectives, this research studied the participants' identity shifts before, during, and after their trip. Building on Kempton and Holland's (2003) model on environmental identity development and general education identity literature, Stapleton highlights how "social identity is tightly connected to ***practice***, ***recognition***, and ***action***" (2015, pp. 95-96, emphasis added). Through engagement with their peers and citizens from the host country directly impacted by it, climate change became elevated as an issue of

personal importance for youth to the extent that it became identity-salient, or significant, in affecting their daily outlook (p. 105). Spurred by peer interactions, these students demonstrated collective behavior shifts after the trip to adopting more eco-friendly lifestyles, such as taking shorter showers, thrift-shopping, or grocery shopping at farmer's markets. Their environmental activism fostered further environmental identity development, when these students were recognized for their behavior and supported in their transformation into more dynamic environmental actors.

Another dissertation study by Grugel (2009) explores the development of children's ecological identity in an intergenerational community garden. Drawing upon environmental theorists like Cobb, Thomashow, and Clayton and Opotow, Grugel conceptualizes ecological identity as a "psychological process that develops out of an individual's history with place and is composed through social interactions with both human and nonhuman beings" (Grugel, 2009, p. 28). Framed within sociocultural learning theories and Bakhtin's notion of "dialogism," Grugel's dissertation highlights the ways that children engage in dialogue among various human and non-human actors (referred to as "other"), learn to appropriate the words of others, and formulate their own discourse, in a social and ideological process of becoming (Grugel, 2009, p. 115). As each community garden is imbued with diverse social, political, economic, historical, and cultural contexts, community gardens are places not only for plants to grow, but for people to "develop deep relationships with the environment and with others around them" in the authoring of their own gardening identity (Grugel, 2009, p. 27).

Personally, one of the most notable findings from this research was the dialogic (not monologic) nature of discourse shared in these relationships with "others." Children and people come to the gardens with past experiences that have formed their environmental ideologies and language, which shape the individual's present relationship with nature and their awareness of future possibilities. "Thus, words are not only dialogic with other words in the present, but they

also invoke the past and indicate the future", writes Grugel (2009, p. 57). My own research study draws upon Grugel's findings to explore the ways that students' past, present, and future sense of self are expressed as they personally define their own gardening identity.

Theoretical Framework

Grounding the semi-ethnographic research is sociocultural learning theory, which I apply to assess the qualitative value of learning from this gardening program. Among various sociocultural theories, Nasir and Cooks' (2009) identity resources theory provides a more specific and practical framework to understand how participation in gardening workshops can mediate the development of students' gardening identities and other food-related behavioral changes. In this section, I elucidate my theoretical framework and the two main questions I pose in this research.

To date, the majority of Garden-Based Learning (GBL) research has focused on quantitatively measuring its impact on children's eating habits or academic achievement, but few studies have explored the quality of these experiential learning opportunities or their impact on children's lives (Urueta Ortiz, 2016). Indeed, it is difficult to quantitatively measure the learning and development that occurs in outdoor gardens and other informal educational settings, but this challenge can be overcome by applying a more qualitative lens. Instead of the traditional view of *learning as acquisition* of inputs and behaviors, sociocultural learning perspectives**,** based on Neo-Vygotskian thought, consider *learning as activity* (Cole & Engestrom, 2007) or *legitimate peripheral participation* in communities of practice where learning can be mediated by various tools, artifacts, activities, and agents (Lave & Wenger, 1991). This theoretical framework can help researchers consider how social and cultural contexts of the learning environment inform and influence students' learning.

In particular, sociocultural learning perspectives provide a valuable analytical lens to better understand the learning that happens in GBL experiences. As students learn and participate within a community of practice, they develop *practice-linked identities,* or a sense of a connection between the self and the activity. More specifically, Nasir and Hand describe practice-linked identities as ones "that people come to take on, construct, and embrace that are linked to participation in particular social and cultural practices" (2008, p. 147). As identity is influenced by social and cultural contexts and interactions, each identity has fundamental implications to what the individual learns and does in and out of school (Urueta Ortiz, 2016). For example, a student from a specific sociocultural background may have felt embarrassed about accessing free food at the Pantry but become more motivated to visit once they saw the Pantry offering more culturally relevant foods, which encouraged the student to become a regular visitor and volunteer as well.

Delving into a more practical aspect of identity research, Nasir and Cooks' (2009) identity resources theory again offers a readily applicable framework to help understand the properties of the learning environment that mediate the shifts in practice-linked identities. Any learning experience, or construction of these identities, is mediated by three important identity resources: material resources, relational resources, and ideational resources. *Material resources* refer to the physical artifacts within the learning setting. Embodied in the interactions among others in the community of practice and with the practice itself are the *relational resources*. Lastly, the *ideational resources* refer to the ideas about oneself and ideas about one's relationship to and position in the community of practice and figured world (Nasir & Cooks, 2009, p. 50). All of these together constitute how this practice (gardening in this case) makes practice-linked identities available for participants and "illustrate the what, the how, and the why of learning" (Nasir & Cooks, 2009, p. 51).

To illustrate this theoretical framework, I will outline how the availability of identity resources can be useful indicators for full participation that leads to genuine, meaningful learning, as compared to short-lasting, peripheral, or inconsequential participation. Gardeners must have access to tools, land, irrigation, and seeds or seedlings to grow, but students on a budget may be hard-pressed to access these material resources for a successful garden. Engaging with members of a community garden can help new gardeners tap into a wealth of locally adapted planting techniques and tips, connections to free mulch or compost supplies, or harvest festivals – a variety of relational resources that provide the means and motivation to continue participating, while individuals gardening on their own may struggle to successfully learn the practice and become more easily discouraged. Permeating the social conversations and interactions are the ideational resources, which generate shifts in the definition of what gardening is, the core practices of gardening that one comes to value, and their perspectives on their own sense of place in the community of practice and larger food system. Individuals who lack access to the network of resources would have to invest much more time, money, and energy to reach the same amount of meaningful participation or harvests. Ultimately, through this project, my hope is to understand how various challenges and opportunities impact the way students do (or do not) see themselves as gardeners. Specifically, my research asks, *how (and to what degree) does access to various identity resources, through the workshop series, mediate the construction of students' environmental gardening identities?*

Because social and cultural identities are intimately tied to the learned and lived experiences of any individual, I also look beyond the construction of gardening practice-linked identities to explore how students' various identities interact with their gardening practice and identity. As a person of color, I know that my own ethnic identity and cultural upbringing were sources of tension in pursuing a master's degree in agriculture. Aside from my lack of long-time experience, learning about the structural and racial inequities flanking our industrial

agricultural system also led me to disconnect from even identifying myself as a gardener or farmer. Considering the predominance of white US farmers,[9] the whiteness of "organic" or alternative food movements, and the discriminative history and racialized devaluation of the food workers today (National Agricultural Statistics Services 2019, Guthman, 2008; Yamashita, 2016), I realize how our history, modern society, and culture colour our food system and dictate how we even classify who a "farmer" or "gardener" is. Motivated by Urueta Ortiz's (2016)'s recommendations for further GBL research to explore the various intersections of one's socio-cultural identities, I seek to explore the processes and intersections of an individual's multiple identities that shape their lived experiences, values, attitudes, and beliefs, in regard to the practice of gardening. The second question I pose is, *how do other social identities (socioeconomic status, ethnic background, gender identity, and other personal traits) interact with students' gardening identities to influence their intent to garden in the near future?*

[9] The National Agricultural Statistics Services 2017 Census documented that 95% farmers of the 3.4 million US farmers are white, while people of color reflect a meager 5% of the farm owner population.

Methodology

Project Implementation

Due to the COVID-19 shutdown enforced across the country and university campus in March of 2020, the Aggies Grow Veggies (AGV) project had to adjust plans for the in-person gardening workshops. While a 10-week long, First-Year student seminar during the fall quarter of 2020 had been the original plan, we pushed the workshops to the spring of 2021 to allow more time for curricular and logistical preparation. Through the Student Farm's partnership with Aggie Compass Basic Needs Center, we secured additional funding to coordinate a virtual gardening series (offered as a 6-week long, extracurricular program, open to undergraduate students of any class year), mail gardening kits to participants' homes, and conduct follow-up research with the participants for this research project.

In the fall and winter quarter of the school year, while working with the AGV team (consisting of undergraduate student Stephanie Tsai and the Student Farm Director) to build up various online gardening resources and the social media campaign on Instagram, Discord, and YouTube, I also collaborated with a Horticulture and Agronomy M.S. student Anca Barcu as my co-instructor to prepare lesson plans for the workshops. With the help of several advisors, faculty members, and Student Farm staff, Anca and I determined the 6-week timeline, set the objectives for each workshop, and planned the gardening tasks and activities. During this time, I also homed in on my research questions, submitted my research protocol to our institutional review board for approval of human subject research, and developed the related surveys and questions for follow-up interviews.

Ongoing since the previous summer was the crucial networking process of building relationships with the academic student support centers, culturally affiliated organizations, other environmental-advocacy student groups, and students. During this networking process,

we were able to identify key stakeholders to partner with in publicizing the gardening workshops. One organization in particular, which I pseudonymize as Advocacy for Students Group (ASG), had expansive resources and outreach staff, even during the COVID-19 pandemic, to address students' holistic needs and meet with our team. Collaborating with ASG enabled us to reach our target population of first-generation students and students from low-income backgrounds. Over the course of several months and Zoom meetings, the ASG team helped us launch and publicize the application for three weeks in January to February of 2021, co-host a pop-up gardening workshop on DIY paper pots as a virtual meet-and-greet, and select 20 students to participate in the series, which we officially dubbed: Gardening 101.

Inspired by the farmer-to-farmer movement, the G101 workshops were structured around the idea of students teaching other students basic gardening skills and sharing horticultural knowledge. As co-instructors faced with the challenge of coordinating a class during COVID-19, Anca and I aimed to make the six, one-hour, virtual, synchronous workshop sessions as interactive as possible, and not just another class in their "Zoom University" college experience. To do so, experiential learning, critical thinking, and practical application opportunities were embedded in each week's introductions / announcements (5 min), icebreaker activity (5-7 min), hands-on demonstration (15-20 min), break-out group activity (10-15 min), and guest speaker(s) presentation (15-20 min) featuring a student gardener or organization in the Edible Campus network (Table 1). Hands-on demonstrations highlighted one garden-related task for that week, virtual break-out groups gave students time to complete the gardening task with guidance from a gardening mentor, and several take-home challenges outlined next steps to take care of their plants or delve deeper into that week's topic (see Appendix D for all curriculum-related documents and lesson plans).

Over the course of the six weeks, my co-instructor and I hoped students would achieve the following learning objectives:

- ★ Apply basic gardening practices and budget-friendly tips to grow your own container garden
- ★ Use your free gardening kit to plant, grow, and prepare your own garden salad
- ★ Connect with other student gardeners and garden spaces on campus
- ★ Consider the many ways that physical health is intertwined with the health of the land and food system

Table 1. Overview of curriculum for students in the Gardening 101 virtual course in the spring quarter of 2021.

Date	**Workshop Topic**	**Guest Speakers**	**Gardening Task**
April 3	WHY GARDEN?	Garden Mentors	Pick up gardening kits Set up potting soil
April 10	PLANTING	Student Farm	Planting radishes and green onions
April 17	TRANSPLANTING	ASUCD Community Garden	Transplanting lettuce, cherry tomato, and basil
April 24	TAKING CARE of my Plants	Project Compost	Applying fertilizer and watering techniques
May 1	DESIGNING my own SUMMER GARDEN	UCCE Master Gardener Network	Student presentations on their ideal summer garden
May 8	COOKING with our Harvest	Student Counseling & Health Services	Harvesting and preparing our garden salad

The Gardening 101 workshop students were recruited primarily through the ASG Program, with preference given to those who had low gardening background or food access. Applications were launched in the middle of winter quarter via ASG's email newsletter and their social media (Instagram). A week before the application deadline, the workshops and applications were also publicized via email newsletters and social media channels across Aggie Compass Basic Needs Center and other culturally affiliated organizations and academic student support groups. We received 30 applications.

Once applications were reviewed by the ASG team and AGV project team, notifications were sent out to fill the spots until twenty students confirmed their intent of participation in a confirmation form, committing to attend six 1-hour weekly workshops via Zoom. Thanks to funding from our sponsors and partnership with the Student Farm, we were able to adapt our in-person workshops to a virtual format and distribute a free gardening kit with live seedlings (cherry tomato, lettuce, basil, and chives) so that students could start their container garden from home. As the workshops approached, students also received the following forms: 1) a packet with the workshop plans and outline of the series, including handouts for notes and a vegetable planting guide, 2) a media release form for Aggie Compass and the AGV project to share the video recordings online, and 3) information on my research study conducted in tandem to the workshop series.

Data Collection & Analysis

As a graduate student researcher who received funding from Aggie Compass to implement this project in the spring of 2021, the research methods for the workshop series carried a two-fold purpose: 1) program evaluation to monitor and evaluate this project and 2) research for my thesis. For the program evaluation, we administered pre- and post-workshop surveys that collected quantitative and qualitative measures regarding students' demographic backgrounds (undergraduate class year, major, race / ethnicity, hometown), gardening background (assessing self-perceived confidence levels with certain tasks), and some preliminary metrics on students' food access and literacy levels (See Appendix A and Appendix B for both surveys).

For my research, I implemented a mixed methods approach to evaluate the shifts in "gardening identity" in student participants and explore the ways that access to the various identity resources shaped students' learning experiences. Data for this research drew from the pre- and post-workshop surveys, workshop assignments (midpoint survey and reflection piece),

and a semi-structured interview session conducted 2 weeks after the workshops. The interviews probed deeper into students' early memories gardening, experiences during the workshop series, perceptions of a "gardener" and their personal identities, and other relevant motivations, interests, and gardening goals for themselves following the workshops (See Appendix C for the interview guide).

Participation in the research study, more specifically the interview portion, was voluntary, as participants were recruited following their acceptance into the workshop series. Students indicated their interest to participate by emailing me or marking a box in the mid-point survey. Out of 20 students, 16 expressed interest in participating in the study, but only 14 students completed the post-workshop interviews. Interviews were conducted via Zoom during week 8 of the 10-week spring quarter 2021 and ranged from 35-55 minutes in duration. As a token of appreciation for their time, participants were compensated with a gift card to Safeway or Walmart for $25. Also, due to the embedded nature of this study within the AGV project, I was able to continue communicating and gardening with several participants even after the research study.

The data analysis process involved different approaches for the quantitative and qualitative data. For the quantitative data on the survey questionnaires, I used the Wilcoxon Signed-Ranks Test to compare the pre- and post-workshop scores on students' self-assessed gardening competencies and preliminary food literacy and access indicators. The qualitative data analysis mostly included data from the interviews, which were triangulated with some of the survey data and my personal observations as a co-instructor for the workshop series.

Interview data analysis consisted of reviewing and revising transcripts (which conveniently were automatically generated for all Zoom recordings), uploading transcripts and survey data onto the Nvivo computer software, and conducting two rounds of coding through all

the data. Both deductive and inductive approaches were used to determine the coding themes. Prior to coding, I deductively chose codes to organize data based on the interview questions related to identity resources, gardening identity concepts, food choice and lifestyles, and personal goals. Over the process of coding, I gradually incorporated other codes and sub-codes using a more inductive approach, as I recognized various themes emerging with respect to level of interest, confidence, motivations, and relationships with "other" (people, nature, gardening, food, and so on) (See Appendix E for my codebook). During the analysis I read and re-read transcripts, listened to the audio recordings, and reviewed the video recordings to make sure I was fully grasping what the students expressed in our interviews. This iterative process of revisiting the data and writing research memos helped me draw upon various experiences, memories, and identity constructions that I may have missed to consolidate interpretations and summarize my findings for this research (Saldaña, 2009). Finally, I organized the quantitative and qualitative data on a spreadsheet to maintain a record with each students' trajectories and summaries of their responses to key interview questions, compare their responses to their pre-post test scores, compile a list of indicative quotes, and note behavioral changes or conceptual shifts with identity. I wrote up my interpretations with respect to the two main research questions to present key findings and themes, which I will share in the subsequent section.

Personal Standpoint & Positionality Statement

With any research study, it is traditionally assumed that the researcher takes an unbiased approach to conduct the experiment or analysis and present the findings and conclusions as objectively as possible. However, qualitative researchers recognize that, as human beings, we carry our own innate preferences, prior experiences, and prejudices that inherently affect the knowledge and assumptions we bring to the research study, the research styles and methods we implement, and even the interpretations and analyses we conduct (Hesse-Biber (Ed), 2013). For that reason, I wrap up my methodology section with a reflection

to acknowledge that "all knowledge is affected by the social conditions under which it is produced and that it is grounded in both the social location and the social biography of the observer and the observed" (Mann & Kelley, 1997, in Hesse-Biber (Ed), 2013). Seeing how feminist research practice does not reject objectivity but rather encourages reflexivity, I want to recognize, examine, and evaluate how my own assumptions and personal background have influenced this study to better account for the subjective positionality of this research.

First, I consider my own standpoint as the lead grant writer, project coordinator, workshop co-instructor, and researcher behind this Aggies Grow Veggies project and study. The various roles I have taken on speaks to the many degrees of influence I have exercised in managing this project, as well as a deeper level of familiarity I have shared with my students as the research participants, as compared to a researcher who may simply interact with the resulting data. As my interview questions touch on more personal topics of identity, I believe that my role has benefited this research with an additional level of understanding, genuine interest, and trust that I, as the co-instructor and researcher, built with my students throughout the workshops. Furthermore, I sought to deconstruct the researcher-researched relationship by taking the interview as an opportunity to engage with them (for the first 1:1 meeting with most students) as both gardening mentor and friend in conversation and co-construction of meaning. At the same time, my role as instructor and researcher may have served as a drawback, as some students could have preferred speaking with an unaffiliated outsider about their workshop experiences. Another limitation has been my inability to consult with other researchers during the data coding or analysis process, outside of brief check-ins with my thesis advisor, to ensure my individual vantage point or biases are not skewing the analysis.

Acknowledging my own standpoint with a critical lens, therefore, is a crucial component of my research methods. Identity is a concept that is hard to ascertain – broad yet specific, ambiguous yet unmistakably clear, innate yet transient. Given that the topic of identity has been a trending topic and the matter of identity politics a point of controversy in our mainstream

society, I would like to spend a moment delving into my own sociological perspectives and background with identity to foreground the ideologies and biases that have inevitably shaped this research study.

As a cisgender woman, heterosexual, Christian, Los Angeles native, Korean American, liberal arts undergraduate college student, and agriculture graduate student in my late 20's, my various identities have shaped (and been shaped) by the knowledge and research that I undertook for this degree. From a sociological perspective, our social and collective identities are viewed as a construct of our times, as social actors come up with conceptual distinctions, or *symbolic boundaries*, to categorize people, practices, time and space (Lamont & Molnar, 2002). Identities regarding race, ethnicity, nationality, gender, sexuality, religion, socioeconomic status, political affiliation, professional career, hobbies, physical characteristics, and so on, arise and manifest according to the definitions that individuals and groups of people have labored to define and produce in our societies. Sometimes, these symbolic boundaries can solidify into *social boundaries*, in which these conceptual distinctions become institutionalized into objectified forms of social differences and give rise to unequal access to and distribution of resources (material and nonmaterial) and opportunities (Lamont & Molnar, 2002, p. 169)

Transitioning from a predominantly East Asian, conservative high school and Los Angeles suburban neighborhood into a relatively diverse, but still mostly white, liberal arts college town in western Massachusetts, I was immersed in an environment where my Korean American identity shifted more so into a self-awareness as an Asian American and ethnic minority and where my Christian identity felt challenged, derided, and often vilified in class and around campus. The concept of identity was fluid as everyone was navigating who they are, where they had come from, and who they were becoming, especially as my liberal arts college campus was a safe, open space for students to "come out" with their LGBTQiA gender and sexual identities. While it was both terrifying and exciting to explore in undefined territories, I have come to realize that certain identities can (slowly or constantly) change or be redefined,

while some are inborn and integral to our existence and humanity. These symbolic boundaries that we come to identify or associate with impact how we view ourselves, the things and way we learn, the choices and actions we take, the goals we pursue, the people we interact with, and places where we sense belonging and deeper community. Realizing how our social and cultural environments affect not only our sense of who we are as individuals, but also who we can grow to become as learners and agents of change in our own lives, has been a powerful tool that led me to this research. How do the people, resources, and opportunities in our surroundings influence our ideological process of becoming?

Another experience that underlies my motivation to pursue this particular research topic is my own journey of getting into gardening, one that involved a struggle over the intersections of my identities. As a biology major and high school salutatorian, I did not know how to reconcile the prospects of being a failing pre-med student and forfeiting the stereotypical, idealized image of success (ultimately becoming a doctor or lawyer) as touted by the normative Asian society. Following this mid-college crisis was when I began to consider a career in environmental science and agriculture, an identity shift that wrought a deep inner conflict knowing that most of my Korean family and community would question such an "outdated" career choice associated with pre-industrial agrarian society. Navigating this identity shift has inspired me to inquire into the many threads of interest that lead an individual to connect with certain identities, hobbies, passions, and career choices, while consciously or unconsciously disconnecting with others. If these cultural ideals, social actors, and societal values could have such a strong say in what I choose to study and learn and become, how powerful of a role does identity play in influencing all of the learning, behaviors, skillsets and attitudes that individuals developed in the classroom, at home, within relationships, and throughout their daily lives?

These are simply a few of the biases, assumptions, and experiences that have shaped my hopes and goals with this study. Certainly, with my in-depth interviews, I have taken care to practice the art of listening and let the interviewee lead me through their experiences instead of

adhering strictly to a scripted agenda. But to say that my lived experiences, personal traits, religious values, cultural ideologies, familial upbringings, and aspirations have been omitted to maintain my objective role would be a profound oversight, and forfeit, of this research's cornerstone. To sever my ideologies and identity completely would make this garden education research void of social and cultural significance. My personal identities and experiences have inspired the design of this project, goals and structure of the workshop series, the types of questions posed in the interviews, the interactions with my students, and the data findings produced. In the ideological garden in which I figuratively stand, the ground that I have once trod, the sun and wind that bear on me now, and the flowers and fruit that will flourish one day, all play a fundamental role in shaping my interests and research study.

Results

The findings of this research are based on the experiences of our undergraduate student participants in the Gardening 101 (G101) Workshops Series, conducted virtually during the spring of 2021 at UC Davis. The first section will begin by summarizing the demographic data of these participants. Names of all participants have been substituted with a pseudonym, either one that they selected themselves or the fruit or veggie they indicated during an icebreaker activity at our first gardening workshop. Subsequently, data for this research study will be presented in the following two sections: 1) demographic data of G101 students, 2) program evaluation of the G101 Workshop Series and 3) research on the identity development of students as gardeners.

Demographic Data of Students

This research study draws on the gardening workshop experiences of fourteen of the students who originally confirmed participation in the workshops. Unfortunately, the data I collected do not reflect the experiences of all gardening workshop participants, as one student did not complete the workshop series after the first week, and three other students did not opt in to participate in the research study. While pre- and post-workshop surveys were completed by 16 students total, only 14 students completed the post-workshop interviews and all the survey questionnaires. As a result, the demographic data provided here is a representation of all 20 students, but the subsequent findings will draw solely from the responses of the 14 participants.

A diversity of social and cultural identities and personal backgrounds were reflected in the 20 original participants of the Gardening 101 Series. For areas of study, students' majors reflected a cross-section of Agricultural majors, Biological Sciences majors, Engineering, and Social Sciences/Humanities majors. However, one area in which we lacked diversity was gender

representation, as the majority of our students, including both co-instructors and all seven of our gardening mentors, identified as female. For ethnic and racial backgrounds, the majority of students identified as of Hispanic, Latino, or Spanish origins, with the second highest ethnic representation being Asian and Asian American students. Scores for self-assessed personal gardening backgrounds and food access also portrayed a range of levels (See Figures 3-7 below).

Figure 3.

Range in Class Years of the 20 UC Undergraduate Students who Participated in the Gardening 101 Virtual Series, Held in the Spring Quarter of 2021 through UC Davis.

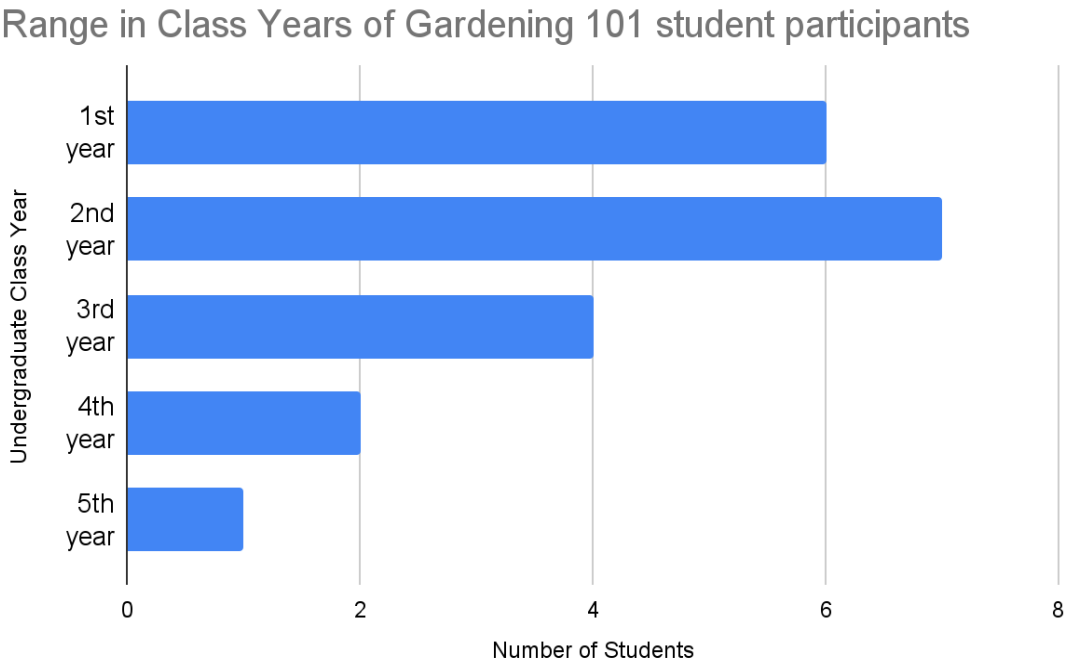


Figure 4.

Gender Representation of the 20 Undergraduate Students who Participated in the Gardening 101 Virtual Series, Held in the Spring Quarter of 2021 through UC Davis.

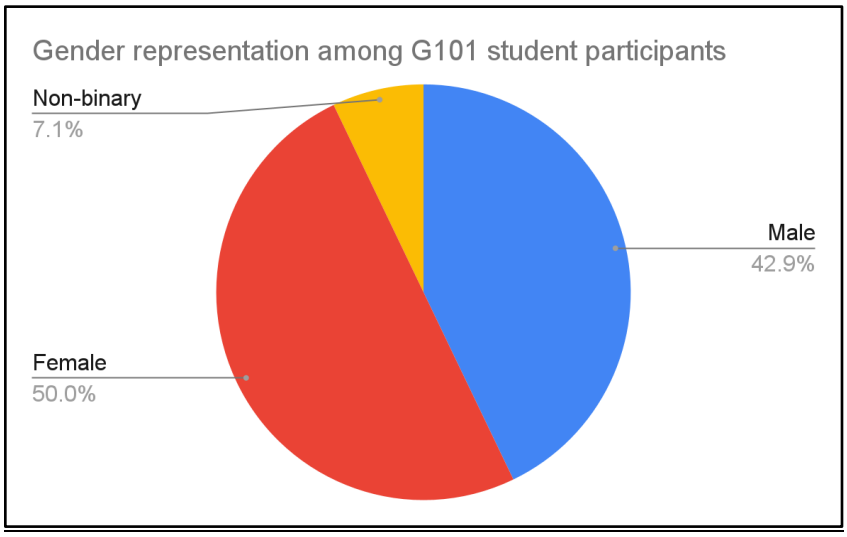


Figure 5.

Race and Ethnic Representation among the 20 Undergraduate Students who Participated in the Gardening 101 Virtual Series, Held in the Spring Quarter of 2021 through UC Davis.

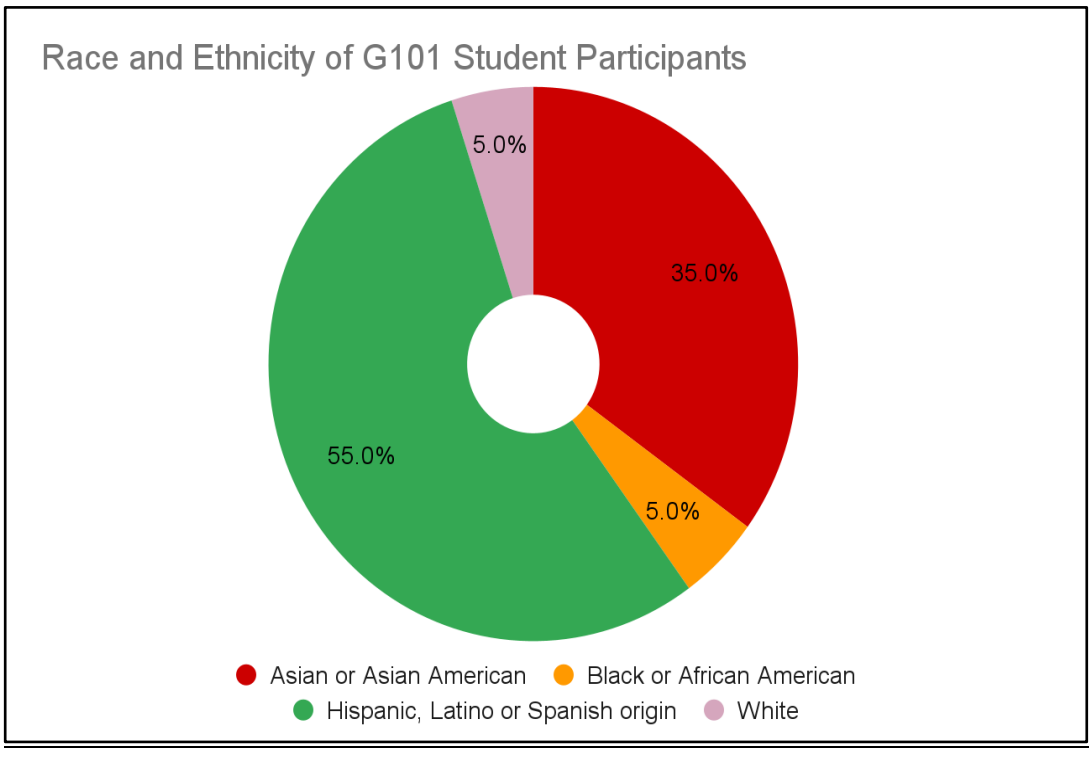
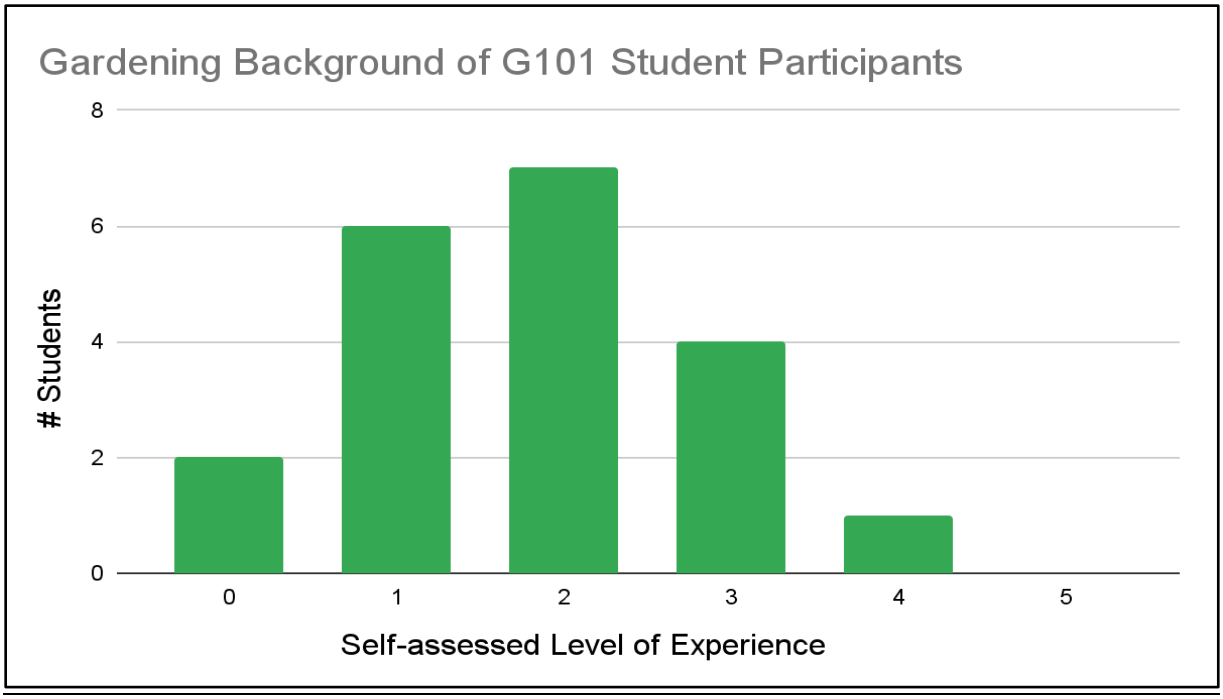


Figure 6.

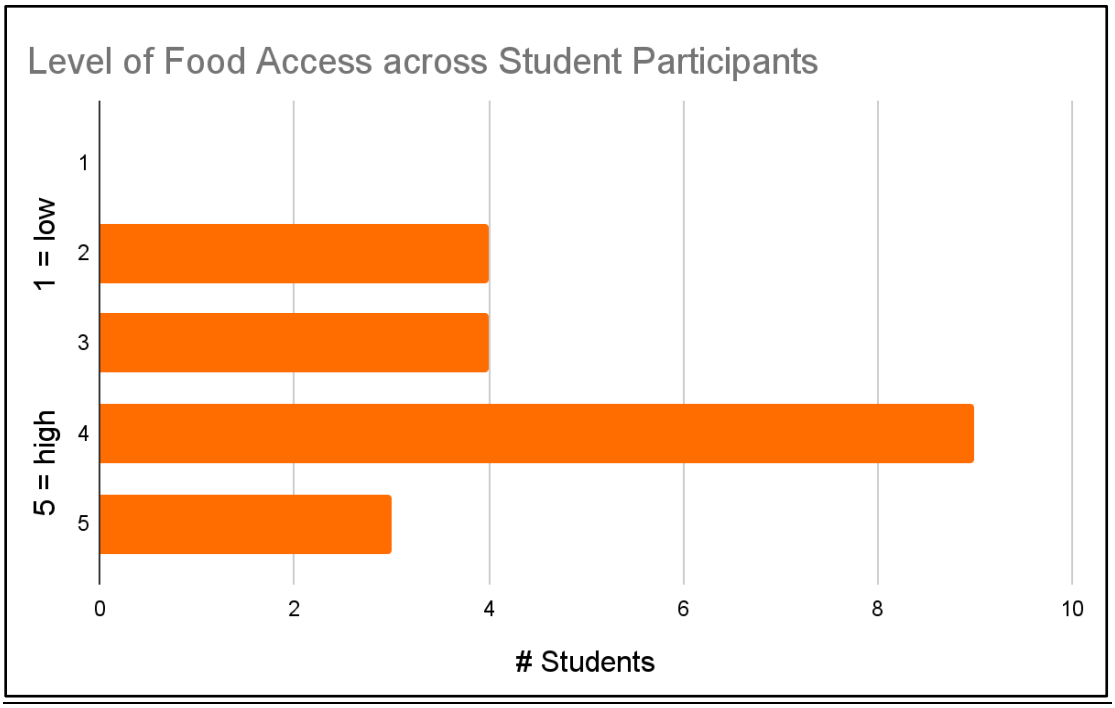
Self-assessed Ratings of Gardening Background by 20 Undergraduate Students who Participated in the Gardening 101 Virtual Series, Held in the Spring Quarter of 2021.



Note: Students shared these self-assessments in the pre-workshop survey in response to the prompt, "How would you describe your level of gardening experience?" Answers on a scale of 0 = low, 5 = high.

Figure 7.

Self-assessed Ratings of Food Access by 20 Undergraduate Students who Participated in the Gardening 101 Virtual Series, Held in the Spring Quarter of 2021.



Note: Students shared these self-assessments in the pre-workshop survey in response to the prompt, "How much access do you feel you have to fresh fruit and vegetables?" Answers on a scale of 1 = low, 5 = high.

Evaluation of Gardening 101 Project

Sixteen of the 20 students completed the workshop series (or attended at least 4 of the 6 workshops), 13 students said they would be interested in continuing to garden at the community garden plots over the summer or upcoming school year, and nearly all of the 14 interviewed students expressed interest in or increased motivation to garden to some extent in the future. In the pre-workshop survey, I asked students to set 2-3 concrete learning goals for themselves during the workshops and then followed up in the post- survey to see how these workshops helped them meet those goals. 12 of the 14 students shared that they successfully reached their learning goals, and several of them went on to express that they felt more comfortable and confident with gardening.

In the mid-point survey, I asked students how helpful they found certain resources provided in the workshops, with answer choices on a five-point Likert scale of 1 (not helpful) to 5 (very helpful). 88% students expressed that they found workshop demonstrations to be helpful (4) or very helpful (5) and 94% students found the gardening kit resources to be very helpful. Gauging the percentage of students who ranked the following as a 4 or 5, 75% students benefited from connecting with gardening mentors, 56% students benefited from connecting with other student gardeners and resources, and 81% students benefited from connecting with other participants in the workshops.

In the pre- and post-workshop surveys, I collected students' self-assessed level of gardening experience, confidence with basic gardening tasks taught during our workshops (ranked on a scale of 1-5: from low to very confident), and level of food access or literacy (on a scale of 1-5: low to high, and other response types). Given that the sample size was limited (N =

14), I ran our pre- and post-survey data through the Wilcoxon Signed-Ranks Test,[10] a nonparametric test designed to evaluate the difference between two correlated measures. It was helpful that this test could run even with a small population size and non-normal distribution.

Based on the quantitative data analysis, students exhibited a significant increase in all of their gardening background scores, comparing their confidence before and after the workshops (See Table 2). For students' self-assessed levels of their own gardening experience, the mean across 14 students' post-workshop scores significantly increased from 2.125 to 2.75 (*p*-value: .04). Among the various gardening tasks listed, students demonstrated they felt the most confident by the end with: "how to water and take care of plants" (M = 3.75), "how to grow plants in containers" (M = 3.63), "knowing what plants need to grow" (M= 3.44), and "planting and transplanting" (M=3.38). The largest increase in mean scores were seen for the following tasks: "knowing what plants need to grow" (+1.81), "knowing when to plant different vegetables" (+1.75), and "how to grow plants in containers" (+1.75). On the other hand, the area that showed the least improvement was "knowing when different vegetables are ready to harvest" (+0.69). These results are helpful feedback in helping us see, as educators, how effective the workshops were for students to acquire skills and understand principles foundational to gardening. This data also show that students gained confidence and competency with the basic gardening practices and knowledge through the G101 Workshop series.

[10] More information on the Wilcoxon Signed-Ranks Test and the calculator I used can be found at this Social Science Statistics website: https://www.socscistatistics.com/tests/signedranks/default.aspx

Table 2.

P-values of Pre- and Post-Workshop Scores in Gardening Competency from the 20 UC Davis Student Participants in the Gardening 101 Virtual Series, Held in the Spring Quarter of 2021.

Gardening Competency Scores			
Pre- and post-survey categories	**Pre-survey scores (avg)**	**Post-survey scores (avg)**	***P*-values**
Level of gardening experience	2.13	2.75	0.04
Planting & Transplanting	2.19	3.38	0.01
Knowing when to plant different vegetables	1.0	2.75	0.001
How to grow vegetables from seed	1.25	2.94	< 0.001
How to water and take care of plants	2.5	3.75	0.001
Knowing what plants need to grow	1.62	3.44	< 0.001
Knowing when different vegetables are ready to harvest	1.88	2.56	0.04
How to grow plants in containers	1.88	3.63	0.002

Note: Students responded to the prompt, "Please share your self-assessed confidence levels with the following gardening task." Answers on a scale of 1 = low, 5 = high.

P-value scores were calculated using the Wilcoxon Signed-Ranks Test. A p-value < 0.05 is statistically significant.

Table 3.

P-values of Pre- and Post-Workshop Scores in Food Access and Food Literacy measures from the 20 UC Davis Student Participants in the Gardening 101 Virtual Series, Held in the Spring Quarter of 2021.

Food Access and Literacy Scores			
Pre- and post-survey categories	**Pre-survey scores (avg)**	**Post-survey scores (avg)**	***P*-values**
Access to fresh fruit and vegetables	4.07	4.12	0.23
Interest in trying unfamiliar fruits and vegetables	4.13	4.11	– †
Interest in growing your own fruits and vegetables	4.08	3.97	– †
How often you prepare or cook meals with fruits and vegetables	3.80	3.68	– †
Servings of fruits and vegetables eaten in a given day	3.49	3.75	0.95

Note: Students responded to five different questions, answering on a scale of 1 = low, 5 = high. To see the exact prompts, please consult Appendix A and B for the pre- and post-workshop survey questionnaire.

† Categories that do not have *p*-value scores did not have a large enough sample size for the Wilcoxon Signed-Ranks Test to form a normal distribution and calculate an accurate *p*-value. A *p*-value < 0.05 is statistically significant.

No significant change was seen in students' food access and literacy scores from before and after the workshops. There was a slight increase in two metrics (students' self-perceived access to fresh fruit and vegetables and their daily intake of fruits and vegetables) but the results were not significant (See Table 3). For the other metrics (interest in trying new fruits and vegetables, interest in growing their own fruits and vegetables, frequency in preparing / cooking with fresh produce), I was unable to generate an accurate *p*-value using the Wilcoxon Signed-Ranks test because the many matching responses had reduced the sample size (i.e. responses where pre- and post- scores were the same were not counted in the sample). Granted, these indicators from our workshop surveys were preliminary, not comprehensive, measures of food

access and literacy, but in part due to the low power of this research sample, these results portray no significant impact on students' food access and literacy levels due to their participation in the Gardening 101 Series.

Lastly, in the post-workshop survey, we added a section that was different from the pre-survey, called the "gardening impact indicators," which I adopted from Diaz, Webb, Warner, and Monoghan (2017)'s survey. On a five-point Likert scale of agree or disagree, these survey statements had participants indicate the level of impact in four different categories, or aspects of their lives: a) appreciation for gardening and the local food system, b) nature and well-being, c) nutrition and cooking, and d) social connections. Only in the 'appreciation for gardening and the local food system' category was there a noticeable impact from the gardening workshops across the three sub-questions in that category. As a result of these gardening workshops, 100% students indicated an increase in their knowledge and skills for basic gardening practices, 85% grew to understand and appreciate the benefits of growing their own food, and 93% grew to increase their appreciation and knowledge of local food systems. However, no other impacts were demonstrated in the other three categories.

Results from Interviews

This research study hypothesized that students who are able to access and connect with identity resources will demonstrate more significant growth in their "gardening identity" and will be more likely to develop skills, knowledge, and motivation to garden in the long run. Building upon the idea that "gardeners come to the garden with particular past experiences with the natural world and … integrate [their] histories with present circumstances" (Grugel, 209), I start off by sharing about students' earlier gardening experiences that preceded the workshop, ones that served as building blocks to constitute their connection with nature, with plants, with other people, with the practice of gardening, and with their own selves. Next, I delve into the

ways students interact with the various identity resources provided during the workshops to mediate their gardening identities. Through the illustration of one student's gardening experiences, I highlight the way that these identity resources have strengthened her connection to the practice, spurred several changes in her lifestyle, and initiated the development of practice-linked identities related to gardening. Lastly, I will explore how students' conceptions about the identity of a gardener intersect with their other personal identities to further connect or disconnect them with the practice of gardening.

Earlier Experiences with Gardening

Even from students sharing their earlier memories with gardening, it was clear that access to each of the identity resources, described by Nasir and Cooks (2009) played a significant role in mediating their preliminary relationships with gardening and their level of engagement with the G101 workshop resources as well. As a brief summary before I dive into a more in-depth explanation in the G101 experiences section, these identity resources are material resources (including seeds, plants, tools, land, water, online resources), relational resources (interpersonal connections to other gardeners or other living things), and ideational resources (ideas about oneself as an individual, one's relationship to gardening and place in the world, as well as ideas about why gardening is good or what is good to know about gardening).

When asked how students got interested in gardening, many pointed to relational resources as a key association that initially engaged their interest. Nine of the 14 students in this research study identified parent(s) or grandparent(s) as the primary reason they got into gardening. For example, in response to the question, "How did you first get interested in gardening?" Cherry, an Asian American female student of Managerial Economics, answered, "I think it's because my dad, growing up my dad had a garden… and then also my aunt is very good at gardening, and so I think I took inspiration from her." A Mexican American, second-year

student in Cinema and Digital Media, Kiwi, grew up gardening with her parents in different spaces in LA, as they had divorced earlier on. “[My mom] would grow tomatoes on the window and stuff like that, and so, I was always interested in that." With her mom, Kiwi particularly enjoyed getting to learn the why’s of gardening, while gardening with her dad and paternal grandparents involved the pleasurable collective routine of waking up early in the morning to tend the chickens, water the vegetables, and make sure the garden was okay. These relationships mediated sustained opportunities for deeper engagement with gardening.

Outside of those with immediate family members who gardened, a couple students indicated their engagement with gardening stemmed from their involvement with an organization or a school club. One student volunteered with her school organization at a shelter garden in LA, where she then received some plants to take home and grow herself. That initial, rather unremarkable experience - of weeding around the garden and attempting to care for her rosemary, basil and tomato plants with her mother - kindled her affinity with gardening that led her to apply for the workshops at UC Davis. Another student, Karin, a “border-town girl” from Calexico studying Nutrition at Davis, got involved with her high school gardening club based on social motivations. Through her involvement with the club, she was able to meet a UC Cooperative Extension worker, who inspired her and other students to collaborate with the cooking club to establish their school’s Farm to Fork program and carry out nutrition research to improve their school lunch program. This pivotal role model was also the reason she eventually decided to pursue her current major of study in nutritional biology.

Lastly, other students who had no personal connection with another gardener or garden expressed a general, longer-term interest in gardening or plants since their youth. Basil, a Mexican American, first-generation college student and fifth-year in Sustainable Agriculture and Food Systems, noted that she had always been interested and wanted to start a garden. She would buy plants with her family at the store and bring them home, but the plants would always

die as neither she nor her family had the adequate knowledge or resources to care for them. Indica, a Mexican and Chicana, female, first-year student in Human Development, carried a long-time passion for flowers, a mutual interest she shared with her mother. While she never had the space, time, or capacity to grow something on her own, in high school, she was able to drive over to a neighboring city to visit her cousin and regularly help out with her vegetable garden. Through these opportunities, she was able to gain more first-hand experience planting and transplanting, connect with nature, and learn more about plants in general.

These relationships with gardeners also served as natural ideational resources, modeling what a gardener looks like and demonstrating ideas about what is good and valuable to learn about and do as a gardener. One student shared that her father impressed certain attitudes and values upon her: "My dad is really into organic food, buying fresh… and shopping at Whole Foods," and consequently, Cherry expressed that "one motivational reason [to garden] is to eat healthy. And to know exactly what is going into the food." Guava noted that her parents have rich agricultural knowledge as farmworkers, but it was not only the technical knowledge they imparted upon her. Rather, "the knowledge [she got from her parents] is kind of just… caring for the earth and that nature space…like how [the earth] is so irreplaceable." By having other gardeners who model the lifestyle of a gardener and share tips on what to know and watch for, students learn to acquire the fundamental values, practices, and mindset that one must have to properly care for plants and, in turn, successfully view themselves as a gardener.

Lastly, these gardeners granted more convenient access to material resources, such as seeds, plants, tools, and land, all of which permitted an easier entry point into gardening. Rose, a Bengali American, second-year Communications major, shared about her experience being able to garden with her mother and grandmother ever since they moved into a house with a big backyard. Pineapple, a Chinese American, male, fourth-year student in Biochemistry and Molecular Biology, commented about the convenience of harvesting from his mom's garden

whenever he was back at home. “You could just go in our backyard and grab a cucumber… or some tomatoes, and I think that's something that also motivated me - I feel like if I didn't have that experience prior to the workshop, I don't know if I would actually be so inclined [to do] the workshop.” Students who did not have a home garden were able to access a gardening space and materials at their school, local nursery store, or neighborhood. Schools provided a venue for students to access the knowledge and physical resources in a way that was tailored to their learning, as exemplified by Apple’s experiences planting lima beans for a kindergarten science experiment or Honeydew’s participation with her class in helping her 6th grade teacher take care of their school garden. These earlier opportunities provided the space and resources for students to connect with plants in various contexts over time, accumulating a constellation of situated events that established their trajectories toward gardening and positioned them as candidates for the G101 Workshops.

Gardening Workshop Experiences

In this section, I examine, how (and to what degree) do the identity resources provided in the gardening workshop series interact to mediate students' gardening identities? During the workshop series, each of the students had access to material resources, relational resources, and ideational resources. However, their experiences with the workshop resources varied depending on their past experiences, the location of residence, the level of connectedness with people who garden within their family or social circle, their degree of success growing their own vegetable plants in containers, and their underlying motivation and interest in gardening. Here, I present my findings on students’ interactions with the various identity resources encountered during the workshops.

Material Resources

In this section, I spotlight my analysis on the material resources, or the physical environment, its organization, and the artifacts in it that support students' connection to the practice (Nasir & Cooks, 2009). In the gardening workshops, the free gardening kit provided a strong incentive for students to sign-up and receive seeds, seedlings, and materials to grow their own container garden at home. Because college students usually lack the time, space, and funds to purchase and develop their own garden, this tailored workshop experience with the necessary materials provided at no cost was a huge help in jumpstarting their gardening journeys, especially for students from low-income backgrounds. Rose shared in her interview, "I love that you guys could give us the plants already [started], instead of having us grow everything from seeds, and all the supplies and stuff. It's hard to sometimes finance that kind of stuff because plants are expensive." Access to these resources helped students clear a significant mental and financial hurdle, in terms of dedicating money or time, to attempting to garden as a hobby.

Providing containers during the workshops helped students clear another common barrier to gardening: the lack of a backyard garden or space to grow their own plants. Many of the students shared an interest in growing plants or starting their own garden someday, but as most lived in college dorms or apartments with limited outdoor lawns or soil, gardening was out of the picture. By learning about container gardening practices and receiving a window-sill container and fabric grow-bag, students were opened up to new gardening prospects. In her mid-point assignment, Lemons, a first-year, Hispanic American, Animal Science major, shared the following reflection:

> "I didn't know that container gardening would allow me to grow my own plants even without a large plot of land, and now I want to know more about how I can continue to care for my plants. Since I'm currently living at home, I have access to a large yard, but it's all covered in concrete with only a sliver of soil off to the side that I can't use, but container gardening has allowed me to use the rest of the space to my advantage."

Growing up in Los Angeles, Lemons shared that it was "hard to be surrounded by nature" or access an open plot of land to cultivate. Those who had carried the hope to have a home garden in the future, like Kale, were excited that their previously unattainable goal was now within reach. In her reflection assignment, Kale, a second-year, nonbinary, white Entomology major student shared, "I have talked with my friends about how exciting it will be once I'm able to have my own garden outside… planting vegetables in this way is like a mini version of a home garden that I'll be able to keep up with for a while." Learning how to use these container supplies strengthened students' connection to the practice by breaking down barriers and reorienting their sense of future possibilities for their gardening aspirations.

The seeds and seedlings in the gardening kit were another crucial resource for students. Often, new gardeners are unaware of the timing and seasonality of plants, such as which season to plant or the time to maturity for different vegetables. As our goal was to have students successfully grow and harvest their own salad vegetables, the Student Farm was very helpful in starting lettuce, tomato, and basil plants (due to their long time to maturity) from seeds to be ready for students to transplant in the spring. We also provided students with radish seeds and onion bulbs (the latter of which were distributed to local students only) to plant directly, as radishes and the onion leaves can normally be harvested within a month. Unfortunately, due to unfavorably warm spring weather in Davis that year, the radish did not grow any roots for harvest, but a couple students who lived near San Francisco or Southern California were able to successfully harvest a couple radishes!

These interactions with planting seeds and transplanting seedlings mediated a personal connection with plants. By the end of the workshops, a couple students had developed a stronger relationship with their plants, even referring to them as their babies (Kiwi) or to themselves as a "plant mom" (Basil). In addition, many of the students' most positive experiences with the workshops were watching the seeds sprout. In her interview, Lemons

shared this moment: “I kind of watched them grow and ever since they started sprouting. I don't know what happened, but I was just so excited, just seeing them sprout… it was just amazing… It just made me feel super happy.” Over the next couple weeks, she purchased a number of additional vegetable and house plants, dedicated herself to reading and researching how to take care of all her plants, and had an impressive backyard container garden to show me in her follow-up interview in May.

The physical resources and handouts from the gardening kit provided helpful, enjoyable, hands-on learning experiences for students. Having the seeds to sow and grow themselves enabled students to witness the full life cycle of a plant. Clementine, a Chinese American, female student in Molecular and Medical Microbiology, observed, “I think it’s super gratifying to see such a tiny seed grow [and] sprout [into] a mature plant that can be harvested from. The cycle of gardening is fascinating to me…” Furthermore, several students highlighted their appreciation for the vegetable planting guide handout[11], a well-designed, visually appealing seasonal calendar “that was helpful because I could see what it could grow throughout the year” (Karin). In particular, Cauliflower, a Chinese American, first-generation college student studying Biochemistry and Molecular Biology, equated the hands-on experience of interacting with the soil with the identity of being a gardener: “The transplanting session definitely made me feel more of a gardener because I was getting my hands dirty.” Her active, successful participation in transplanting, which she had set as a personal learning goal, was one milestone that marked her growth in experience and confidence as a gardener.

These relationships with plants helped students take a notable step towards seeing themselves as gardeners. Pineapple noted that “I most felt like a gardener during the workshop when I saw my radishes start to sprout and they were really strongly growing.” Having access to

[11] http://sacmg.ucanr.edu/files/117117.pdf

seeds as living things and witnessing their growth cultivated in students the motivation to care for and meet the needs of their plants. Lemons described the considerable care she dedicated to making sure her plants would not get scorched in the LA sun, sharing how she would move her plants around several times a day to make sure the plants received the ideal amount of water and sunlight. Clearly, these seed and seedling resources offered a direct connection to living plants, bridging the gap for students to learn what it takes to care for plants and, for some, start to see themselves as gardeners.

Relational Resources

An analysis of relational resources helps us explore the way that positive relationships with others, situated in a given context, can increase one's connection to the practice (Nasir & Cooks, 2009). Throughout the workshop series, students had various opportunities to connect with a spectrum of experienced and novice gardeners. Each of the 1-hour Zoom meetings on Saturday mornings were attended by both co-instructors, 3-5 mentors, 1-2 guest speakers, and the other participating students. Though we were limited by the COVID-19 quarantining policies set by the university, my co-instructor Anca and I intentionally set up spaces for students to enjoy the social benefits of engaging in conversations and learning with one another through icebreaker activities. During each workshop, we also made sure to coordinate at least one "break-out group" time, so that students could engage with other students and one mentor in smaller settings. In these break-out groups, students performed the designated gardening task, asked questions, and shared about their gardening plants or thoughts on any discussion questions we posed. Outside of class, students also were able to connect via Canvas (the university's communication platform for classes) or Discord, where our AGV media coordinator had designed a special channel for direct messaging and group chats.

Serving as key relational resources were the mentors recruited for the gardening workshops. In the initial application to the Gardening 101 Series, students had the option to opt into the garden mentorship program, and 14 of the 20 students (10 of our research participants) indicated their interest in being paired with a mentor. For the most part, students would be assigned into the break-out groups with their mentor and paired mentee, and they also had the opportunity to work together on the garden-design project (for Workshop 5). Those who opted out of the mentorship program were assigned randomly into other groups or with one of the co-instructors.

One of the main points of positive feedback from the workshops was regarding the mentorship program and their personalized guidance. A black, female, third-year student in Managerial Economics, Honeydew remarked, “I've enjoyed all of the support that we've had to ensure that we're better able to succeed in our gardening journeys, especially since I'm very new to gardening.” As they accompanied students in the learning process, mentors offered tailored tips on how to care for plants. Basil noted, “Sometimes I’m like, you should be able to figure this out, like it’s pretty simple, but I think I still like the guidance of knowing that I’m not doing this by myself.” While most information on basic plant care can be found online in the present age, having real people to share their experiences and real-time advice made a difference in the level of confidence students felt. As Indica put it, “having the extra confirmation helped… like someone that already has experience telling me, “Yeah, this is okay. This is how much you should water” - it really helps.” By providing curated tips, content, and support, mentors helped contribute to students’ gardening successes, which would further increase their level of confidence as a gardener.

Opportunities to share their garden with other people provided an additional level of accountability, motivation, and support. Apple, a third-year, male student in Electrical and Computer Engineering, who loosely identified as an Asian American, shared one underlying

motivation to care for his plants well was the accountability of his peers. For example, “if I go to all the gardening workshops and my plants all die, then it just looks really bad for me, so it's a further incentive to take better care of them.” Several students, like Cherry and Lemons, Zoomed into the gardening workshops with their housemate or family member, partaking in the pleasure and knowledge of learning about gardening together. Having additional community to share the gardening experience provided extrinsic motivation for others as well. Personally, Basil would “get really excited when I can go outside and be like, “guys, look at my basil - it’s thriving!” I think… I’m proud because I didn’t know that I could do this. So definitely having other people to share it with has really kept me going and being like, ‘This is something that I want to keep doing, especially even after I move out of Davis after graduation…’” For Basil, this socially motivating factor of sharing her gardening accomplishments, especially one that she had not believed possible, provided extra validation in front of her housemates and friends. Framing this example with Kempton and Holland’s (2003) environmental identity model, the *recognition* she received from engaging in this *practice* further motivated a commitment for persistent, longer-term *action* to develop her identity in becoming a gardener.

Just as with students’ earlier gardening experiences, the relational resources in these workshops supplied students with a scaffolded structure to acquire the behaviors, skills, and attitudes integral to the practice of gardening. Kiwi was one of the several students who appreciated the visual support of seeing someone do the gardening task with her and knowing how to follow along more easily. She explains, “I think that learning to garden and actually doing the demos with other students and mentors really helps encourage me not to overwater and exert too much stress on the plants.” Interacting with other gardeners and with living plants provided the context for students to learn how a healthy plant compares with an unhealthy plant, to recognize their physiological cues signaling a lack of water or sunlight, and respond to their needs. Apple’s remark points to this motivation to meet the needs of their plants: “I definitely

appreciate the seedlings as they provided a solid base for the workshop. I felt far more compelled to take care of them over the seeds (as they had not sprouted yet) in the beginning." Over time, the students began to engage in a dialogic relationship with plants, both acting upon and being acted on by the plants, as they learned to express and understand the needs of the other. Through the development of this self-other relationship with plants, students learned to adopt the behaviors, skills, and attitudes of caring for their garden, driven by the desire to meet the needs of "other," consisting of animate and inanimate, living and nonliving things in our world (Grugel, 2009, p 29).

Overall, many of the students expressed positive feedback for the warm, friendly environment at our workshops. When asked in the midpoint survey what they enjoyed the most so far, Kiwi shared "I have enjoyed the very-welcoming environment!" and Cauliflower commented, "I really like the music played in the beginning of the workshop. It really helps to promote a relaxing and friendly environment. I also like breaking out into breakout rooms to do the transplanting and demos. I find it very nice to be able to ask a mentor questions in a small group setting." For everyone, and especially for the less vocal or introverted students in the group, the break-out groups were spaces where they could share different tips and perspectives related to gardening and forge new friendships. Indica spoke of the sense of belonging she experienced during the workshops: "I really liked how everyone was able to connect. It kind of felt like a family to be honest, because everyone was very engaged and excited about the workshop, and it didn't feel like I'm forced to be here."

Within this inclusive, interactive, and enjoyable space, students had the opportunity to delve in deeper relationships with a larger community of plant-growers and nature-lovers. These relationships also connected them with additional support for greater confidence and competence, scaffolded their adoption of gardening behaviors, skills, and attitudes, developed their self-other relationship with plants, and left them encouraged to pursue gardening more in

the future. In wrapping up this section, I will share a quote from Grugel, who comes to a similar conclusion in her dissertation reflecting on the complexity and importance of these relationships in community gardening: "the 'greatest benefit is not the harvest of veggies but the cultivation of relationships' (Wild, 2009, as quoted in Grugel, 2009, p. 49). As gardeners work collaboratively to design, plant, care for, and harvest veggies from a community garden, they develop and nurture relationships with the earth, with other gardeners, and with the place itself." (Grugel, 2009, p. 49).

Ideational Resources

For the ideational resources, I look at the ideas that students form about themselves and their relationship to gardening, their sense of place in the practice and world, as well as ideas about what is valued or good (Nasir & Cooks, 2009). Out of the three types of resources, this one was the most non-intuitive and difficult to grasp. Halfway through writing up my results, I realized that I had misinterpreted this concept, simply tying ideational resources to the *why* and *how-to* knowledge connected with the practice. Consequently, I had to re-organize my coding and analysis of results to ensure I was implementing this concept accurately. In this next section, I summarize three examples of ideational resources that students demonstrated in their interviews: a mindset shift in regard to their position as a growing gardener in the spectrum of learning, an awareness of the larger community of gardeners, and an understanding of important plant knowledge to know.

Delving into the first example, Kiwi's gardening journey is particularly illustrative of the idea she formed about herself and her relationship to gardening. One new perspective Kiwi gained through the workshops, specifically through her mentor, was that it was okay for gardeners to make mistakes and learn from them.

> “I started learning, when I was in like put in the breakout rooms, that even my mentors - they're still learning as well! They were saying, "I did that last year, but that messed up this plant so I'm trying this year, this new [technique]," and I was like ‘Oh! If someone who's been doing this for years is still messing up, it's fine for me to mess up every once in a while… we're all still learning.’ So that kind of helped me in terms of my confidence, to work with this and to engage with this…”

Prior to the workshops, the practice of gardening and becoming a gardener had seemed too complex and unattainable for Kiwi. But by the end, this realization that everyone is on the learning spectrum helped shift her concept of who a gardener is and affirm the gardener that she was becoming. However, her gardening background scores did not reflect any change, as she had given herself a score of 2 (ranked out of 5, with 5 being the most experienced) in both the pre- and post-workshop surveys. When asked about these self-assessment scores, she explained, “the reason why I kept it the same is because I believe I'm still learning, and I'm still messing up… the thing is like the workshop – even though it's ending, it doesn't mean that like my gardening time is ending. Like, if anything, this ignited this whole journey that's going to be like a lifelong, because I really, really enjoy this.” Once she began learning, she also began to realize that “she had so much more to learn.” In evaluating her own position in the larger spectrum of beginning to experienced gardeners, she proudly acknowledged herself to be a “baby gardener.”

A second ideational resource is the sense of a larger community of gardeners that students could connect with. Aside from growing a successful container garden, one of our other objectives that we had in coordinating the G101 series was to point students to a network of student gardening organizations and on-campus resources. The COVID-19 pandemic had largely forced gardening to become a solitary activity, but following the workshop series, we wanted to ensure that students felt they had further opportunities and spaces to explore if they so desired to continue on in their gardening endeavors after G101. In his mid-point survey, Pineapple especially noted, “I really enjoy the demonstrations and also the campus partners because it brings a new perspective into gardening and the different opportunities out there.” In planning

these workshops, Anca and I recognized that the 6-week series could only do so much in introducing the world of gardening to them. So, while we aspired to cover the basics, we also emphasized the resources on campus and in our local community to introduce students to the larger community of practice of gardeners at Davis and beyond. Honeydew was one of several students who was encouraged along these lines after realizing that there were other young folks like her who were into gardening. In her midpoint assignment, she reflected: "Being in this G101 series with other peers interested in gardening as well as a mentor, I've realized that there's a genuine community around gardening which is also super appealing to me. Hopefully, this is the push I needed to keep gardening! :)" Situating herself as one member of a larger community of student gardeners was a powerful ideational resource that helped Honeydew visualize herself gardening and become more motivated to do so.

Third, the recognition that plants have different needs and ways to care for them was key for students to develop an understanding of what is good and important to learn about gardening. Clementine shared that, through the workshops, "I gained a lot of valuable knowledge about what plants need and how different plants need different kinds of settings to grow." Her mid-point reflections explain further:

> "Before this gardening course, I had tried planting a variety of plants.... However, most of these endeavors ended up in plants that would shrivel, wilt, and ultimately perish. At the time, I guess I didn't realize how different plants are from each other and how these differences correspond to the living conditions they prefer. It also made me realize that I need to research and actually build up my knowledge before bringing on a commitment of caring for a plant."

In contrast to her frustrated endeavors before the gardening series, Clementine was one of few students who were able to successfully harvest a mature radish root by our last workshop. Though this was in part due to her location near San Francisco, where her vegetables enjoyed a milder climate than the majority of those that sustained the Davis area heat, this realization was significant in helping Clementine adapt her practices as a gardener to each plant and

understanding the different seasons and varying needs of each plant. In her pre- and post-survey score, Clementine rated herself a 1 in both, but this lack of change in her quantitative scores does not reflect the motivation she gained to build her knowledge of various plants.

Similarly, Basil noted a change in her understanding of plants. “At the beginning... I think the knowledge that I had about gardening was very basic, I guess. I was like, “you put a seed in the soil and then you water it and then that's it.” But I think through this class or like through the workshop, it really encouraged me to look at different resources and see the different things that the plants needed.” This change in perception was Basil's explanation for her shift from a 2 to a 4 out of 5 in her pre- and post-workshop gardening background scores. Previously, she was unaware that she needed to “take into account how much you have to water the plant, and like plant food or keeping the soil moist and stuff… so [the workshop] really has opened the door to wanting to learn more about plants.” As a result, during the workshops, Basil expanded her vegetable garden with some cucumber, pepper and cilantro plants that she acquired through a local plant giveaway. Though she encountered some troubles with caring for these plants, she was determined that she would “find how to fix her” and boldly navigate the uncertainties of caring for her plants, armed with the knowledge of what to look out for and the confidence that she could rely on various online resources or people to guide her.

Interaction of the Identity Resources

The identity resources theory offers a lens to focus on the key components that build into this ideological process of becoming a gardener. The material resources have lowered the financial, physical, and mental barriers to entry into this practice and provided the hands-on materials for students to participate in the planting and cultivation of their vegetable plants. The relational resources - embodied in relationships with mentors, other student gardeners, community members, and the plants themselves - have supplied personalized guidance for

greater confidence and competence, accountability and motivation to commit to this practice, and scaffolded support for students to develop the behaviors, skills, and attitudes of a gardener. Some of these attributes were conveyed as ideational resources, such as students learning to take on a growth mindset, situate themselves within the larger community of practice, and attune themselves to their plants' varying needs. From the earlier memories leading up to the workshops and the gardening workshop experience itself, "the identity resources that we have described both constitute a way that the practice of [gardening, in this case] makes practice-linked identities available for participants and illustrate the what, the how, and the why of learning in [gardening]" (Nasir & Cooks, 2009, p. 51). To illustrate how these identity resources interact, I will share a closer analysis of one student's gardening journey. Though this example is definitely not representative of most G101 students' experiences, this individual's story is descriptive of the ways that the presence of and interaction among various identity resources can promote the development of practice-linked identities and more deeply connect the individual with the practice.

Previously introduced in the results is Lemons, a female, Hispanic American, first-year joining our G101 Workshops virtually from her home in Los Angeles. Though she identifies as a nature-lover now, Lemons did not have many outdoorsy experiences as a child until high school, when volunteer opportunities at a local shelter garden and arboretum initiated her love for nature. Her first gardening attempts with the rosemary, sage, and tomato plants she'd received for her volunteering efforts were not successful. Instead of being discouraged by the plants dying, however, the pleasure of interacting with plants developed a deeper desire to have "a little piece of nature that I can take care of." When she saw the opportunity to learn more about gardening in her ASG email newsletter, she jumped at the chance to apply for the G101 Workshops. During the workshops, she shared that "seeing my radishes grow throughout these few weeks has been so invigorating and exciting that I can't help but want to do more container

gardening." Lemons so enjoyed the practice of going outside to care for her own vegetable seedlings and was, in particular, more motivated "especially now, like in COVID, like I haven't been able to go outside so… just wanting to experience nature more," that she began to stock-pile on more plants. By the time we got to our interview in June, she had cultivated a whole backyard garden that included watermelon, poinsettia, mint, citrus tree, potatoes, tomatoes, and hydrangeas, on top of the G101 vegetables.

One thing that stood out to me from Lemon's story was the extensive support she received from her family. Lemons shared that her mother and grandmother had gardened in Guatemala, so from the start, her mother was very helpful in "making sure that I met [the plants'] needs, because at first, I didn't know how to water properly." In addition, her brother, who worked in the construction industry, was instrumental in setting up the entire backyard patio with tables and benches for the potted plants and a shade cloth for protective cover from the hot LA sun. She even got her younger sister to join the Zoom workshops on Saturday mornings. Clearly, the incredible development of Lemons' backyard garden over the span of several months was not just an individual pursuit, but a collective effort. Her family members served as key relational resources, significantly strengthening her connection to gardening by accompanying her in this journey, supplying physical resources as needed, and helping her rise to the challenge of caring for a growing home garden.

Through the interaction of these various identity resources, Lemons was able to begin identifying with the practice of gardening. When asked if she could relate to the image of a gardener, or someone who "knows a lot about plants … and [has] really successful harvests", she replied, "I think I'm getting more and more into feeling that. I don't think I completely feel like I'm a gardener, yet, but I guess a novice gardener if anything." Building upon her earlier encounters with nature, this G101 workshop experience had helped advance her situational interest into a longer-term investment, placing her on an inbound trajectory to becoming a more

intentional, committed participant in the gardening community of practice. This shift could not have been so significant in the mere span of two months without access to identity resources, such as the material resources that allowed her to witness the "amazing" process of plants going from seed to fruit, the relational resources to learn from and make gardening more fun, and the ideational resources giving her a sense of what is valued in the practice and directing her goals for herself as a gardener. Illustrating the last point is one quote she shared as feedback:

> "The workshops were definitely… a good foundation, just letting me know how to go about with plants, and then doing my own research too on the Internet and Google and all that. It just really helped me understand the different stages and how I should go about taking care of them, like what I should look out for…. Especially with all these different plants, they each have different needs so I have to make sure I cater to them."

Before the workshops, she had struggled to keep her rosemary, sage, and tomatoes alive; but now, equipped with a surer understanding of plants, attentive care, and a vigorous passion to grow whatever she could, her backyard garden was not just surviving, but thriving.

Another noteworthy point from the interview was Lemons' grit with gardening. I had worried that many of the student gardeners would become discouraged or give up trying to raise heat-sensitive, cool-weather crops like our radishes in the LA desert climate, but Lemons eagerly took on the extra work of researching how to care for her radishes and discerning how much light and water they needed. She acknowledged that "learning my way around that… was like a bit of a problem, but it wasn't a bad problem. It was like a good problem, because I knew what I needed to learn, what I needed to like to research and what I [had] to look into just to figure out what they needed." Through this experience of raising her own vegetables, Lemons came to redefine the "problem" as an opportunity for growth and learning. During the interview, many students shared that their positive and negative experiences in the workshops dwelled with relative successes or failures in growing their vegetable plants. In contrast, Lemons shifted this negative outcome with her plants as a positive experience to build her competence as a gardener, thus empowering herself with a sense of agency and confidence.

Learners are motivated to engage when they recognize a sense of future, or value in engaging with the content or opportunity for future, longer-term engagement within a community of practice (Azevedo, 2012). For Lemons, the gardening dreams that had previously been deemed inaccessible became feasible with the idea of container gardens. In her mid-point reflection, she shared, “I never thought that I could grow anything in just a pot, I always thought that plants had to go into the ground to live… once I do leave home, I know that I won’t have to worry about my plants since container gardening allows for apartments to be a garden.” Over the course of her gardening journey, Lemons started to demonstrate the practice-linked identities of a backyard gardener and developed a newfound curiosity to try new vegetables and fruits, even wondering which other vegetables from the grocery store she could grow. “Before I [saw] vegetables, and I'm like "I don't want to eat that.” I’m just like really picky with food. But like now, I know how much work goes into… growing these produce, and I just can't refuse them the same way I did before… So I'm just more open to it and I try to eat more…” For her new goals after the workshops, she expressed an intent to try growing other things, including dinosaur kale, and an aspiration to “grow something that my family can eat… kind of depend more on the garden.” Later, Lemons shared in separate correspondence that she had brought her indoor plants to UC Davis to have her own garden with her and was “loving every second of it.” Nasir and Cooks (2009) describe practice-linked identities as “one viewing participation in the practice as an integral part of who one is” (p. 44). From the changes in her lifestyle to her nurturing intentions centered around the continued flourishing of her plants, it is clear that this practice of gardening has bloomed into something more than just a hobby, but as a significant part of her developing environmental identity.

Intersection among Gardening and Other Personal Identities

In this next section, I will share my findings in response to the question: *how do other social identities (socioeconomic status, ethnic background, gender identity, and other personal*

traits) interact with students' gardening identities and their intent to garden in the near future? In the personal standpoint section, I shared my own experiences first getting interested in gardening and how that has shaped my interest in this topic in gardening identity development. Aside from the purpose of evaluating the gardening workshops, I was interested in the intersections between an individual's various personal, social, and cultural identities and the practice-linked gardening identity. For many students like myself, growing up in an urban, industrialized society where agriculture is associated with a declining industry and unpopular career choice, the practice of gardening comes with a host of preconceived notions about farmers or gardeners. Below, I delve into a summary of students' descriptions about what a gardener looks like and then proceed to four examples of students connecting or disconnecting with the identity of a gardener.

When asked in the interview, "In your own words, what does a gardener look like to you?" students answered with various attributes, ranging from personal traits and physical characteristics, interest in plants, and lifestyles. Students who responded with traits ascribed gardeners as hardworking and self-sufficient (Cauliflower); gentle, calm, and patient (Cherry); and mindful and caring for the environment (Karin). Apart from these personal characteristics, others associated gardeners with certain material resources, such as farmers who have "a little red barn with fields… and rows of the vegetables and fruits that [they're] growing" (Indica). One student shared that the first image that came to mind was "a white guy with a pickaxe" (Honeydew). In general, several students noted a slight conflict between traditional and modern views of a gardener, contrasting between a traditional farmer growing in-the-ground crops or a home landscaper mowing lawns, and a more modern version of a gardener as anyone growing plants in containers or raised beds (Basil, Pineapple).

Other students defined a gardener according to their interests and lifestyle practices. Clementine shared that her "image of a gardener is anybody who has an interest in plants and

cultivates vegetables, fruits, trees, flowers, things like that." Kale shared that she views a gardener as "somebody who wants to connect to the earth and stuff, and like definitely connect to family too." In her definition, she interestingly adds a relational component to the definition of gardeners as people who are not only interested in plants and nature, but also bear a social motivating factor to garden. Some students went further than simply describing anyone interested in gardening to someone demonstrating the behavioral practices of a gardener. Basil and Kiwi attributed gardeners as people who "[wake] up early and just [tend] to whatever type of garden it is" (Basil), while Apple strictly associated gardeners as edible plant growers who "[grow] their own food, or [eat] the food that they grow." Both Lemons and Rose elaborated on their definition of gardeners to add that they must not only demonstrate extensive knowledge or care for their plants, but also produce successful harvests, because, as Rose put it, "you can't be a gardener if your plants are dying."

Up to this point, my findings have mostly highlighted students who connected positively with the practice of gardening, but here I will cast light on several cases of students who navigated the interplay of their various personal identities to, either in part or full, disconnect from the gardening *practice-linked* identity. For some, it is clear that those identities linked with personal traits played a significant role in defining their practice of and connection to gardening. For Cherry, she had viewed a gardener as someone who is gentle, calm, and patient, and when asked if she related to the image of a gardener, she declined, saying, "I don't think so, I think I'm pretty impatient actually." Her response indicates an awareness of her own standing in comparison to the common characteristics of other gardeners, leading her to disconnect from viewing herself as a gardener.

In a similar trend, Pineapple shared his findings that gardening was not as sustainable as he had thought. "Learning how to grow your own food, that sounds so sustainable, and it sounds… practical right? But, from my experience, it's not anymore…" As an easygoing, yet

challenge-seeking person who admired the concept of sustainability, Pineapple had been drawn to the idea of gardening, especially the notion of having his own lettuce and cabbage in the backyard to harvest readily and throw into a salad. While he believed that "anybody, like I can be a gardener, because a gardener just involves… planting their own vegetables or fruits and taking care of it." But through the experience of actually growing his own container lettuce and seeing the "the yield, the effort, inconvenience and also the bugs that come with it" led him to realize that small-scale gardening was not as convenient as he had imagined. Before the workshops, he felt he could relate to the image of a gardener, but due to the conflict with his practical nature, he no longer could relate to the practice-linked identity of a gardener.

A third case example is Guava, a 1st year in Community and Regional Development, who came to the workshops to learn about gardening because of her involvement with the community garden project at Knights Landing, a town near Davis with a significant migrant farm worker population. As the daughter of a farmworker, Guava had grown up surrounded by agricultural fields and had helped her parents when they started their own backyard garden. In her interview, however, she demonstrated various inner conflicts in identifying as a gardener, let alone any other common identifiers, because she felt those identities were not embedded in her own practice or lifestyle. For example, though descended from Mexican / Hispanic backgrounds and her father from indigenous (Purépecha) roots, Guava struggled to use these labels to describe herself, admitting that "it's not my identity to say. It's not my lived experience, and I know a lot of indigenous people in Mexico probably face more hardships and it's not my identity to take at all."

Through gardening, Guava had hoped to reconnect with some of the indigenous heritage that had been lost, to carry on the tradition of "caring for the earth," and to learn how year-round gardening could become "an integral part of [her] food consumption." During the workshops, she relished the messiness of pouring soil into her containers during the planting

workshop and was thrilled to see her seedlings pop out. Despite these positive interactions, she disconnected with gardening because it did not impact her personal food choice and diet as she had envisioned. A gardener, in her opinion, was someone who takes whatever space they have and plants in smaller scale, determining what food they would like to eat. But as a college student without her own space to garden and dietary choices restricted to the food offered on campus, Guava struggled to identify as a gardener and felt discouraged in her pursuits.

While Guava may have felt disillusioned momentarily, she demonstrated agency in taking some measures of control into her hands. Attending a Chicanx food studies course during the same quarter, she was inspired by the Decolonize your Diet: Plant-Based Mexican-American Recipes for Health and Healing cookbook to purchase an electronic crockpot and learn to cook her own beans from her kitchen-less dorm. She demonstrated her creativity in resourcefully designing a vegetable garden with upcycled crates for our workshop's culminating garden design project. In the interview, she shared that she looked forward to the summer, when she planned to grow more veggies from the raised beds her father had constructed for her during the workshops. While Guava may have recognized gardening would not present an immediate increase in food access or community food security, this opportunity allowed her to connect with her family and ancestral roots. In the future, she aspires to learn more about the food system, labor policies, and benefits for migrant families working in agriculture.

One last example I will share is of Basil, who starts off disconnecting, but ends with a positive connection to gardening. Although she grew up with an interest in gardening since childhood, Basil never had the opportunity to learn or start gardening until the G101 workshops were advertised in the ASG newsletter. As a fifth-year, first generation college student, Basil had to navigate the stigma associated with accessing certain resources available on campus. In retrospect, she shared that her fear of being judged for needing these resources made her lose out on many opportunities. However, through this G101 experience, she realized that "you

shouldn't be embarrassed because it's something cool that you want to try, and if they're going to give you the resources, why not try and do it?" By pursuing the G101 workshop opportunity, Basil was able to connect not only with her love for nature, but also her social, adventurous character. The COVID-19 pandemic had pushed her to want to go outside and create a reason for her and her housemates to spend time together outdoors, and her outdoor container garden became the space that she could enjoy sharing with her friends. Furthermore, she particularly appreciated "being able to just grow food that… has a good cultural connection… for example, like the peppers or the cilantro (that she got from a free plant giveaway), I get really excited over those, specifically." Through this workshop experience, Basil was able to redefine what it means for her to be a first-generation college student, Mexican American, adventurous, nature-loving plant-mom who grew her own vegetables and herbs and incorporated them into delicious meals she would share with her housemates.

While I could go on to enumerate the cross-sectional analyses of all our students' paths navigating their burgeoning identities as gardeners and such, for the purposes of this thesis paper, I feel it conclusive enough to share that they are just that - one of the many paths, wide or narrow, crooked or smooth, that leads students along or away from the trajectory of becoming a gardener. Overall, the more identity resources and connections bridging an individual's interest with gardening, the stronger the connection to the practice and greater the potential for developing a practice-linked identity. As Pineapple pictorialized when explaining why he chose to learn more about gardening, "Yeah there's a lot of factors that played into this… so many factors that just add up, like rays shooting out one thing. So, if there's a bunch of circles, a bunch of like external factors that point to gardening, and the opportunity arose so I took it." Whether these rays are interests that lie with cooking, connecting with one's heritage, enjoying the outdoors, nurturing a bit of nature, or socializing over mutual interests, these lines of interest combined may ebb and flow, drawing an individual closer to or away from a longer-term

trajectory toward developing that identity. In the next section, I will proceed to discuss the significance of these results and situate my findings among the research scholarship on gardening interest and practice-linked identity development.

Discussion

In the discussion, I would like to return to the goals and intentions stated at the outset before I compare the findings with relevant literature and discuss the strengths and limitations of this research. Without a doubt, some of these goals and research questions have shifted away from what I had originally planned, as I had to narrow down the scope and focus of my research. During the project design and planning phase, my original interests dwelled in studying the qualitative development of gardening identity, through the lens of identity resources theory, and its quantitative development in relation to demonstrated growth in several gardening competencies, behavioral changes associated with healthier eating, and critical awareness as consumers in our food system. Acknowledging that longer-term behavioral changes lay outside the scope of our 6-week gardening workshop series, I had hoped to look at intentions for behavioral change as a proxy for behavioral adoption to evaluate the impact of these gardening workshops on students' access, literacy scores, and lifestyles related to food.

For the most part, the main application of Nasir and Cooks' (2009) identity resources theory to a novel practice has remained the same. This study implemented this theoretical framework to evaluate how (and to what degree) access to material, relational, and ideational resources provided in the G101 workshops mediated students' "gardening identities." With my second research question, instead of the originally planned quantitative assessment of gardening identity development, I shifted to a more qualitative approach in studying the intersections among students' various identities as they navigated their journey through the G101 series.

What is New about Your Findings, Relative to the Literature Review?

Admittedly, this study may not provide a thorough explanatory mechanism behind the initiation and intensification of students' interests in gardening, nor a clear-cut analysis outlining the spectrum of students in their process of becoming gardeners (or not). I have,

however, undertaken and completed a comprehensive study that applies the identity resources theory to assess how and what kind of resources fundamentally shape the journey of learning and developing a gardening practice in a way that becomes a meaningful part of their identity (Nasir & Cooks, 2009). Only one other study, from the literature and databases I have perused, has studied the development of practice-linked identities in the context of garden education: Urueta Ortiz's (2016) qualitative case study of an intergenerational garden-based learning project at the University of British Columbia in Vancouver, Canada. Building on her recommendations for further research, this study not only looks at the impact of a gardening project on students, but also surveys the intersections of various social identities (race, gender, socioeconomic status, etc.) and personal characteristics that interact and inform the construction of practice-linked identities. Also, while many studies on environmental gardening identity and practice-linked identities have focused on the development of youth in primary or secondary school (Blatt, 2014; Stapleton, 2015; Urueta Ortiz, 2016; Grugel, 2019), I chose to highlight college students and their learning experience at their stage of young adulthood.

What is Supportive of Prior Work?

This qualitative study on the G101 students reinforces the findings from Nasir and Cooks' study demonstrating how "relational resources sometimes served as a kind of gateway to material and ideational resources (and thus as a gateway to learning)" (2009, p. 57). Their exploration of learning and identity in high school track and field athletes found that the coach-athlete relationship was central in determining the level of access they had to other resources. It was mostly through one-on-one interactions with the coaches and their presence in the physical space that athletes gained a deeper understanding on how to utilize the field or equipment, train with proper technique, and position themselves in the mindset of a hurdler, jumper, thrower, sprinter, or distance runner (Nasir & Cooks, 2009). In a similar study with a high school basketball team and mathematics classroom, Nasir and Hand (2008) illustrated the importance

of having opportunities to take up integral roles and make unique, personal contributions in understanding the students' learning and development of practice-linked identities. It is clear that instructors and their influence in staging the learning environment determines not only the quality of interactions but the level of students' access to the domain.

What surprised me about the findings in this study was that each of the students came to the G101 workshops with earlier gardening experiences, and each story highlighted the significance of key identity resources students accessed, both leading up to and during the G101 workshops. The presence of family members or friends who gardened and taught them how to garden were crucial *relational resources* in facilitating students' initial connection with gardening, while interactions with the G101 mentors or other participants helped build a community of support, accountability, and motivation to get through the challenges with gardening. Supplementing the gardening workshop demos, these relationships connected students with more tailored knowledge, and thus more access, to successfully utilize the gardening kit, seeds, and seedlings and master these *material resources* as part of their learning. Through these interactions, students recognized their position in this figured world of plants and living things, gained a sense of what is important to know or attend to in caring for their vegetable plants, and identified new goals for themselves as they advanced their perception of what gardening entails and what kind of gardeners they could be – permitting their progressive access to key *ideational resources*. Rooted in a network of these identity resources, students were able to develop a more personal connection to the plants they saw sprouting, cultivate the attitudes, knowledge, and behaviors integral to the practice of gardening, and situate themselves as novice student gardeners among a larger community of practice outside the workshop.

But what is actually happening behind this process of learning and identity development? How is this learning process significantly mediated by these identity resources?

Grugel conceptualizes ecological identity as a "*psychological process that develops out of an individual's history with place and is composed through social interactions with both human and nonhuman beings"* (2009, p. 28). Grugel's dissertation speaks to the dialogic nature between self and the human, nonhuman, animate or inanimate "other" that mediates the process of becoming a gardener. For Bakhtin (the Russian thinker who first conceptualized dialogism), the process of developing a self, or one's *ideological becoming*, involves an exchange between two distinct, diverse types of discourse: authoritative discourse and internally persuasive discourse (Grugel, 2009). *Authoritative discourse* refers to the official doctrine of our community, the already acknowledged, externally proclaimed truths and realities. *Internally persuasive discourse* is our everyday internal discourse, or "what we think, believe and understand about the world; it is our ideological self" (p. 55). As our internal discourse interplays with the discourse of "other" that may differ from our own, we engage in a struggle to develop our own ideological stance in relation to the authoritative discourse. The more encounters we have with the language of others, especially those with opposing viewpoints, the more opportunities we have to assimilate or reject these words and ideas, and the more we advance in our ideological development. "It is within these tension-filled interactions… that people develop an individual identity" (Bakhtin, 1996, as cited in Grugel, 2009, p. 55).

Perhaps relational resources play such a prominent role in mediating identity development precisely because individuals are naturally confronted with various discourse embedded in the dialogical relationships with other gardeners, with other living things, with nature, and with themselves. In speaking about the benefits of relational resources during G101, for example, Apple recounted that, "just having someone to share the connection with… to gardening in this case, is super helpful because it pushes you. It opens you to new perspectives that you hadn't considered before." Interactions with peers and their garden mentor in the Zoom break-out room, as Apple was alluding to, was one of opportunities that students had to

share, learn from, and be confronted with varying opinions, outcomes, preferences, and gardening practices. These social interactions also impacted Honeydew, who "realized how fulfilling gardening can be from seeing my peers be invested in taking care of numerous plants, and it offered me a new perspective that gardening can actually be cool and even spiritual." These encounters inspired an internal shift in how appealing gardening could be for her own practice in the future. Enlivened by interactions with the radishes sprouting and with a larger community of gardeners, she grew through this dialogic process of coming across an external discourse that differed from her own and re-constructed a renewed interest and relationship with gardening.

As students enact their own gardening identity and (are forced to) contend with different types of discourse, these dialogic interactions grapple not only with their present circumstances, but also recall their past memories. Based on her research at the community garden, Grugel notes how adult and child "gardeners come to the garden with particular past experiences with the natural world and an environmental language. When in the garden, gardeners draw on the discourse and actions of the community to continue the process of constructing or re-constructing a garden self" (2009, p. 33). Drawing from the G101 students' definitions of what it means to be a gardener and what type of behaviors or actions signify their own position in relation to that identity, I have observed that their discourse regarding gardeners is based on past experiences with other people, places, and practices in the world of gardening. In Guava's case, for example, her idealistic definition of a gardener (as a self-sufficient individual with continual access to food) contrasted with her own lifestyle and practice (as a beginning gardener with only several container veggies), leaving her to wrestle with her practice-linked identity as a gardener. As Grugel says, "meanings from these words are marked with prior voices, histories and contexts, but meanings can change through critical dialogue that takes place in social settings. As meanings change, new identities are formed as individuals appropriate - take up

new words - and make them their own" (p. 57). My findings reinforce Bakhtin's theory (1981) that one authors their identity through this interconnected dialogue, spoken or unspoken, shared through social interactions with other beings and the situated environment, between one's past histories and present self.

Building on the past and present, students' gardening identities are influenced by their future projections for themselves as well. Though I did not get to analyze the shifts in students' learning goals (essentially future hopes or expectations) from the pre- and post-workshop surveys for this paper, their responses elicited self-assessments of their recent commitment to, outcomes of, and ways to improve their practice. Their reflections on their future goals or intentions to continue gardening or not demonstrated their inward or outward trajectory along the gardening community of practice. Even in applying for the G101 workshops and committing to this extracurricular activity for one quarter, these students were affirming their desire for a sense of future that participation would impart by gardening (Azevedo, 2013). The interactions among past, present, and future identity is evidenced in the motivations that students indicated in the pre-workshop survey and build off preconceived notions that this practice of gardening could ideally afford them, including motivations to get outdoors and enjoy nature (especially given the COVID-19 quarantine season), be environmentally sustainable, enjoy aesthetically enhanced living spaces, increase their food access, grow foods that connect them with their culture, or connect with their spirituality. In the process of constructing the self, Sandstrom et al. (2003, as quoted in Grugel, 2009, p. 33) emphasizes the relevance of past, present, and future in this way:

> *"When we act toward ourselves and others in a given situation, we are affected by our* ***memories of the past,*** *including our memories of the roles we have performed, the statuses we have achieved, the relationships we have negotiated, and the successes and failures we have experienced. We are also influenced by our* ***thoughts of the future****, including our thoughts of who we might become in the next situation or even several years from now.* ***When we fashion acts and identities in a particular***

> ***situation, then, we do so as people who have lives that extend beyond that situation - lives that include pasts and futures, as well as goals and responsibilities other than those we are currently enacting."*** *(emphasis added)*

As individuals navigate through changing time and place, their level and extent to participating in a practice may ebb and flow, an inevitable case for most students in our short 6-week G101 workshops. Whether they were attracted to the aspects of interacting with nature, growing one's own food, cooking, socializing with peers over mutual interests, connecting with one's cultural or religious heritage, and so on, the level of access to different infrastructure or resources they have after the workshops will be key to structuring the continuation of their practice. People's interest-based participation will also rest on how resourcefully members utilize and engage in these activities across the various sites of practice (Azevedo, 2013). This makes sense that practice-linked identities can vary across space, time, and communities depending on the varying access to multidimensional, intrapersonal forms of the practice, because Lave and Wenger's theory on legitimate peripheral participation defines learning as a situated activity, mediated by and among the persons, artifacts, activities, and setting (Lave & Wenger, 1991). Thus, the changing environments and shifting levels of participation lead to negotiated and re-negotiated constructions of identity.

A quote from Honeydew articulates this process of learning by doing and participating in the practice: "gardening just seemed more possible or accessible… as I went through the workshops… And obviously still have a lot to learn. And the more I garden, the more I would learn…" Her last sentence encapsulates the crux of sociocultural learning theory. Learning as activity is conceptualized as shifts in participation in ongoing, shared activity structures within a community of practice. It is through participation – engaging in a dialogic relationship with plants, acquiring skills and knowledge about the practice, and gradually adapting more central roles within the community of practice – that students begin to develop a deeper sense of connection to the practice and define who they are in relation to the practice.

What is Different from Prior Work?

While this study has generated rich data for the question on identity resources and the intersection of various identities, one aspect that was different from anticipated was the scarcity of data on gardening intersections with race. Perhaps if the interview guide carried more specific questions tailored toward conversations on racial identity, or perhaps, if the G101 workshops had incorporated a space for participants to discuss matters related to food justice and larger racial inequality issues surrounding the food system, then students may have been more willing, or primed, to consider these intersections between race and gardening identity. Another consideration is that as a person of color myself, the students may not have felt it necessary to elaborate about race. From the interview data, there were references to the various connecting points between gardening and ethnic identity (majority identified as Hispanic or Asian American) that helped students strengthen their relationship with family, heritage, or cultural foods through gardening.

One student, Honeydew, who identified as an Eritrean Muslim, did attribute the image of a farmer to be the practice of "a white guy with a pickaxe", affirming the stereotype that I had carried with the agricultural profession. But in unpacking these notions of a gardener and reconsidering whether or not she could relate to that image, she recalled that she knew many of her relatives who gardened, both in the United States and back in Eritrea, and shared that, "in terms of my identities, I feel like there's still a bunch of like black Muslims who do garden, and like… I don't think [my cultural identity] stops me from feeling like I don't fit in as a gardener." Instead of her ethnic identity, she admitted that her level of active participation in the practice was a more salient determining factor of her gardening identity: "When I think of what would make me feel more like a gardener is just like consistency. Like if I'm growing something I feel like I'm a gardener. If I'm not, then maybe I'm a gardener on pause…"

Honeydew's insights point to the interconnectedness of practices and personal identity. When individuals arrive at a place or community, they bring with them multiple identities that are in constant interaction with their past memories, present circumstances, and future goals, in flux across changing times, people, and places. Scholars have used Critical Race Theory to label certain identities (such as their ethnic, gender, sexuality, social status, and so on) as more salient than others in determining levels of power and subordination to groups of people. Through this small exploratory study on students' gardening developments, what I have seen, rather than the prominence of certain identities intersecting into multidimensional layers of marginalization, is the interconnectedness of multiple identities that rise in salience or retreat to the back, in continual interaction and accompaniment. The indigenous framework of "interconnectivity views all aspects of individual or community identities as ever-present" (Maina-Okori et al., 2018, p. 288). Along the same vein, in the process of developing practice-linked gardening identities, students have weaved together strands from their ethnic and cultural heritage, religious or spiritual worldviews, family and socioeconomic background, school education, and many inseparable, interconnected aspects of their identity to construct their relationship with gardening, plants, nature, and themselves.

Another significant difference worth mentioning is the special circumstances of our G101 workshops. Given the historic circumstances of the COVID-19 pandemic, this research is not situated in a specific place because the workshops were conducted via Zoom, with students joining from respective locations in dorm rooms / home. To be clear, I do not conceptualize the G101 class as a community of practice in and of itself. Lave and Wenger (1991) define this term as "a set of relations among persons, activity, and world, over time and in relation with other tangential and overlapping communities of practice" (p. 98). As our class of twenty students is not embedded in a physical set of relations spread across time and space, our fabricated curricular setting is limited in the roles and responsibilities our participants would take on

beyond completing assignments, engaging with the content, and attending class for six weeks. While interactions with students were restricted in some ways, online platforms also made it easier to disseminate information, meet with students Zooming in from various locations, and share in this unique community with other peers who found comfort in growing vegetable plants "together," at their respective homes during the year-long lockdown.

What are Limitations or Weaknesses?

Having positioned my findings among other scholarship, I take a moment now to consider some of the limitations and implications of this research. While I coordinated this project from inception to completion, with the wonderful support and guidance of my AGV team of course, various factors beyond my control limited the scope and sample size of my research. Given the short time frame of this study, studying the longer-term behavioral change or impact from this 6-week gardening series was illogical. Though asking students about their intentions for behavioral change could have been a proxy indicator for research purposes, McGuire (2015) states that "the influence that attitudes have on behavior is generally overstated or never explicitly discussed, with the underlying assumption being that attitudes are predictive of behavior" (p. 700). Furthermore, my thesis advisors and I deemed that intentions were not suitable to extrapolate or represent identity. As a result, it is not surprising that we did not get any significant results from our survey on the gardening impact indicators, though students did demonstrate an increase in their self-assessed competencies with gardening tasks (Table 2). Granted, these indicators from our workshop surveys were preliminary measures, but these results portrayed no significant impact on students' food access and literacy levels due to their participation in the Gardening 101 Series.

Given the small sample size and short study, I chose to focus on qualitative measures to more deeply understand the students' experiences, backgrounds, and contexts that shaped their gardening endeavors. However, implementing a quantitative study to measure students'

gardening identity on a spectrum may have helped make this mixed methods research more robust. Before conducting this study, finding previously tested surveys suitable for the specific learning outcomes (including gardening and food literacy) posed to be a research endeavor fitting for another master's thesis. However, in hindsight, I could perhaps have implemented Kiesling and Manning's (2010) Environmental Gardening Identity Scale (EGID) survey as a measure of one's ecological gardening practices or a Connectedness to Nature scale (Mayer & Frantz, 2014), and then used these survey results to study any associations with short-term behavioral changes or other self-assessed gardening competency scores from our pre- and post-workshop surveys. Some further research recommendations would be to conduct a longer-term study following up with student participants, several months or a year after the workshop completion, to more directly assess their engagement with the gardening practice, level of access to or continued utilization of identity resources, and gardening identity development. Additionally, while it would theoretically be convenient to have a survey tool tracking an individual's identity development on a linear scale, a unidimensional, standard survey would not quite serve as an appropriate evaluation to sufficiently gauge the identity shifts and learning that is distributed across the social and cultural setting. Efforts could be made to design other mixed method approaches to more holistically track students' identity shifts, according to the level of access to key resources or opportunities for engagement.

Lastly, due to the voluntary nature of this research study, our sample of students who participated in the follow-up interviews were incomplete representations of the overall experience from the workshops. For the most part, students who self-selected themselves to participate in the interviews were likely those who had positive experiences and dedication to gardening, but this research inherently excludes the experiences of students who did not complete the whole 6-week series, perhaps due to disinterest, busy academic schedules, emergency circumstances, or so on. If we were somehow able to contact and survey these last six students, this research findings would have a more comprehensive overview of contrasting

experiences and greater spectrum of gardening identity development among the student participants.

What is the Strength of My Claims?

As this G101 series was mediated and coordinated by me from inception to its completion, I am privileged as the researcher with a unique sphere of influence to ensure an ideal learning setting for students and set-up for the research study. Thanks to the support of our sponsors, these workshops facilitated direct access for these students to interact with the key identity resources related to the practice of gardening – the gardening toolkit and seedlings, garden mentors and co-instructors, and an engaging, experiential, and encouraging environment to situate their learning.

Besides the "controlled" experimental design, the strength of this study is the relationships I have formed with my students. As the co-instructor and researcher, I enjoyed the chance to engage more personally with them during the interviews and hear about their gardening journeys. Through these conversations, in which various layers of past, present, and future internal discourses were being internalized and externalized, I was grateful for the chance to co-construct together what was most meaningful from the G101 experiences, learn more about our own identities, and identify what gardening means for us. While the workshops were short in nature, my hope is that I am only one of many relational resources, these experiences just one of the many other memories that students will carry along with them into their future pursuits in gardening and beyond.

Conclusion

In this study, I have followed fourteen students through their Gardening 101 workshop experiences to evaluate the impacts of this 6-week series through the lens of identity. Grounded in Nasir and Cooks' (2009) identity resources theory, this study demonstrates the importance of material, relational, and ideational resources in mediating identity development, with relational resources sometimes serving as a gateway to access the other types of resources. Drawing also from Bakhtin's (1981) dialogism theory helped me to articulate the role of language permeating these relationships, serving as the canvas of ideological development as individuals either accept or reject the discourse they encounter with "other". As conceptualized by various sociocultural learning theories, learning and identity development are two distinct, yet overlapping processes that are both distributed across people, place, objects, and activity in a figured world. With this basis, access to identity resources can play a role in building on situational interest, leading to longer-term motivation and a greater sense of belonging, agency, and confidence in one's capabilities. This study leaves several critical implications, specifically directed toward garden educators, but generally applicable for instructors and development practitioners in any field.

One of the key implications is that more intersections with an individual's interest and other identities can strengthen their connection to a given practice and develop a practice-linked identity. According to surveys, students came to the G101 workshops with motivations to grow and cook with their own food, connect with nature, learn more about culturally relevant plants, planting, and so on. Along these lines of interest, they were able to connect with gardening by raising their own container vegetable garden at home, gaining new insights on insects, soil, and plant health, and engaging with workshop instructors, mentors, and other students. At times, through dialogue with other people, plants, and place, students had to reconcile differences between their original anticipations and what gardening realistically entailed, or how much water and sun their plants received compared to what the plants actually wanted. It was through

the combined interaction of various identity resources and through the dialogue in these self-other relationships that students enjoyed greater access to the whole domain of practice and developed a sense of whether or not they see themselves as gardeners.

Students' practice-linked identity can fluctuate depending on the availability and utilization of resources and level of commitment to the practice, but, as many students attested in sharing about their gardening journeys, relational resources are pivotal in sustaining longer-term engagement and sharing access to valuable identity resources. In traditional classroom settings, educators can play that key mediator role by anchoring learning activities based on students' topics of interest and then using such topics to feed into longer-term goals. By doing so, they can design instruction for interest-based engagement of multiple preferences over time (Azevedo, 2013). For learning outside of school settings, connecting with a larger community of practice where individuals can access the domain and take up integral roles can provide favorable conditions for continued practice (Nasir & Hand, 2008). Incorporating opportunities for self-expression and unique contribution, like our students did with their final "design your own garden" project, will help individuals stay motivated, grow in competence, and learn to negotiate and re-position their participation at the individual and group level. For "when individuals feel that their identities are linked to the settings they are in, they are more engaged and learn more" (Urueta Ortiz, 2016, p. 158). The more opportunities individuals have to engage in different roles, the more chances they will have to access various resources and develop a practice-linked identity with fuller membership and participation within the given community of practice.

As my contribution to scholarship around garden-based learning, some specific advice to engage with youth and adults of all ages, backgrounds, and levels of interest or experience is to seek out as many meaningful connections between gardening and learners' other interests or identities, and then facilitate a space for deeper exploration around those intersections. An example of more learner-centered instruction in the garden could be to coordinate lessons

highlighting different gardening styles or culturally relevant foods, or better yet, offering a chance for individuals (who have some demonstrated background or interest) to share what they know. Encouraging sharing of knowledge and resources can build the community of practice with the mindset that everyone can contribute and learn from one another, naturally creating opportunities for members to engage in different roles and levels of participation. For younger students, presenting the information in an interactive manner is important to increase collaboration, motivation to participate, and a sense of belonging. This can be done by involving students with age-level appropriate tasks, hands-on activities, creative art projects, science experiments, cooking demos and taste tests, discussions, and so on. Lastly, cultivating space for intentional reflection and collective sharing of memories, milestones, future goals, and impactful experiences can help individuals to both internalize and externalize the many learning moments permeating the dialogic self-other relations in gardening. In recognizing the interconnectedness of various identities, these spaces can serve as powerful catalysts for individuals to bridge the past, present, and future and advance in their ideological journey of becoming.

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Appendix

A. Pre-Workshop Survey Questions

Intro questionnaire

1. What is your **full name**?
    1. Preferred name (if different from above):
    2. Pronouns:
2. What **year** are you in your undergraduate career at UC Davis?
3. What is your **program of study?**

    a. Major(s)
    b. Minor(s)

1. **Age**: How old are you?
2. **Gender Identity**: How do you identify?
3. How would you best describe your **ethnic / racial background**?
4. What **city / time zone** will you be located during the spring quarter?

Gardening Background questions

Prior to this workshop series…

5. How did you hear about the Gardening 101 Series?
6. What are some of the **primary motivations** behind your interest in gardening?
7. How would you describe your level of **gardening experience**? (scale of 1-5
8. Please share your **self-assessed confidence levels** (scale of 1-5) with the following gardening tasks:
    a. Planting and Transplanting
    b. Knowing the season to plant different fruits and vegetables
    c. How to grow vegetables from seed
    d. How to water and take care of plants
    e. Knowing what plants need to grow
    f. Knowing when different fruits and vegetables are ready to harvest
    g. How to grow plants in containers

9. Please share any **learning goals or expectations** you have for these workshops. What do you hope to gain or achieve by participating in these workshops?

Food literacy & Food access questions

10. How much access do you feel you have to fresh fruit and vegetables? (scale 1-5)
11. How interested are you in trying unfamiliar foods? (scale 1-5)

12. How interested are you in growing your own food? (scale 1-5)
13. How often do you prepare and eat meals with fresh fruits and vegetables?
    a. Daily
    b. Couple times a week
    c. Once a week
    d. Once every so often

14. How many servings of fruits and vegetables do you eat in a given day?

Source: American Heart Association

15. In your own words, please describe what healthy food means or looks like to you.

B. Post-Workshop Survey Questions

Gardening Background questions

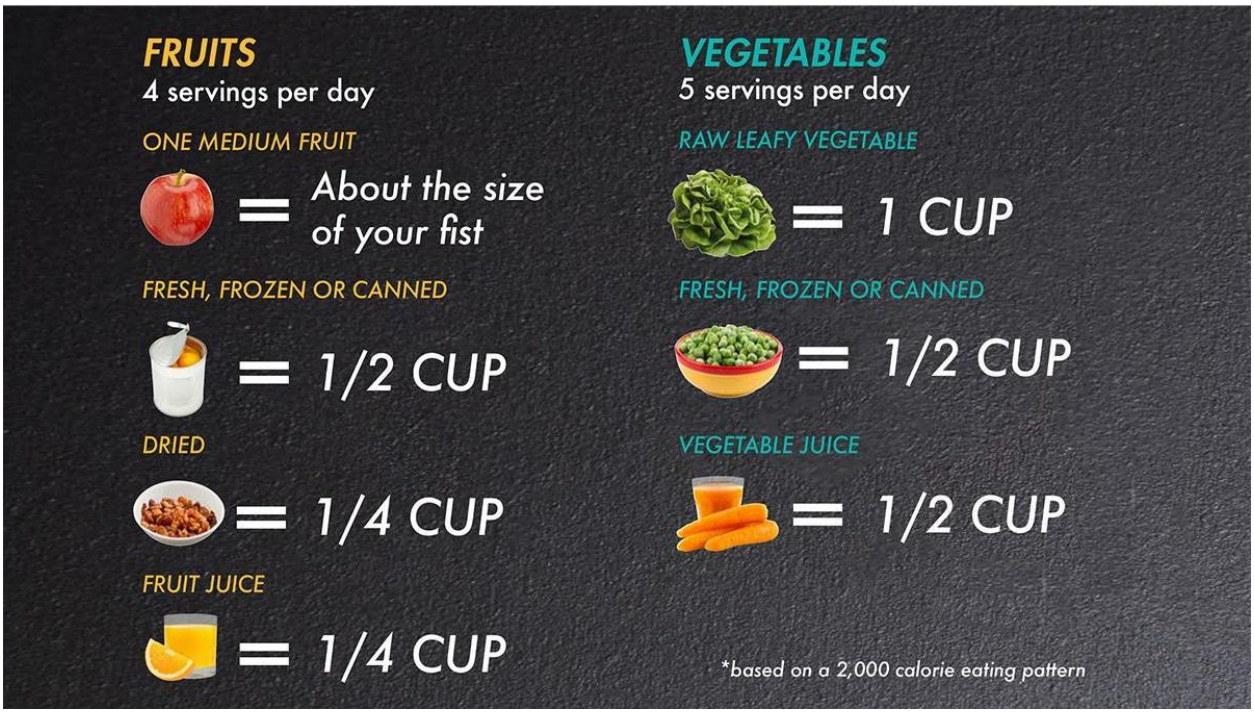
Following this workshop series...

1. What are some of the **primary motivations** behind your interest in gardening?
2. How would you describe your level of **gardening experience**? (scale of 1-5)
3. Please share your **self-assessed confidence levels** (scale of 1-5) with the following gardening tasks:
    1. Planting and transplanting
    2. Knowing when to plant different fruits and vegetables
    3. How to water and take care of plants
    4. Knowing what nutrients my plants need
    5. Knowing when different fruits and vegetables are ready to harvest
    6. How to grow plants in containers
2. Looking back at the learning goals or expectations you had at the start of these workshops, how have you met (or not met) those goals by participating in these workshops?
    - Do you have any other goals for yourself after these workshops?

Food literacy & Food access questions

16. How much access do you feel you have to fresh fruit and vegetables? (scale 1-5)
17. How interested are you in trying unfamiliar foods? (scale 1-5)
18. How interested are you in growing your own food? (scale 1-5)
19. How often do you prepare and eat meals with fresh fruits and vegetables?
    e. Daily
    f. Couple times a week
    g. Once a week
    h. Once every so often

20. How many servings of fruits and vegetables do you eat in a given day?



21. In your own words, please describe what healthy food means or looks like to you.

Gardening Workshop Evaluation Questions

Questions adapted from the results of this study:
Diaz, Webb, Warner, and Monoghan (2017). Impact Indicators for Community Garden Programs: Using Delphi Methods to Inform Program Development and Evaluation

Please identify your level of agreement with the following statements:

- Answer choices will use a seven-point Likert-type scale
    1 = strongly agree
    2 = agree
    3 = somewhat agree
    4 = neither agree nor disagree
    5 = somewhat disagree
    6 = disagree
    7 = strongly disagree

These gardening workshops…

- Helped me understand and appreciate the benefits of growing my own food
- Increased my knowledge and skills for *basic* gardening practices
- Increased my appreciation and knowledge for local food systems

Nature & Well-being

- Led me to enjoy and appreciate nature more
- Increased my time spent outdoors
- Increased my level of physical activity and exercise
- Improved my well-being
- Helped me deal with stress or anxiety

Nutrition & Cooking

- Helped me change my attitude toward healthy foods and made me more willing to include more vegetables in my diet
- Increased my knowledge in preparing healthy meals from fruits and vegetables
- Helped me understand nutrition as it related to my food choice and overall health
- Increased my healthy food consumption (e.g., fruits & veg)
- Made me want to try cooking with new foods (e.g., fruits & veg)

Social Connections

- Increased my connection to community (awareness, appreciation, and respect)
- Increased my ability to teach and share with others what I have learned about gardening
- Made me want to share the value of growing foods and get others interested in gardening
- Made me want to try cooking with others more and sharing meals together

C. Post-Workshop Interview Guide

Introduction:
In this series of Gardening 101, we as a class have delved into an intro to basic gardening practices, and also shared in a space that reflects on the identities, motivations, lifestyles, and attitudes revolving around gardening.

In particular, this study is interested in **identities,** how the various resources made available to students during these gardening workshops influence the learning experience, and how these experiences interact to influence the social and cultural constructs of our identity (or various identities). So as a way to understand and explore how gardening has impacted our participants, we'd like to ask you the following questions.

1. As an **introduction** to get to know you, please describe yourself in five ways (with descriptive adjectives and nouns)
    - ideas: where do you come from, physical traits, hobbies, interests, aspirations, etc.

Initial Interest or Experiences with Gardening

2. How did you first get interested in gardening?

3. Tell me about any early experiences or first memories of gardening.

4. What led you to apply to these Gardening 101 workshop series?

Identity Resources

5. (If interviewee has gardened previously) Were there any people, resources, opportunities, etc. that played a significant role in your initial interest or continued practice of gardening?

6. Tell me more about your overall experience with the workshops:
    - (probing questions) in particular, how has your experience been …
        - Using the gardening tools? (gloves, seeds, containers, hand tools)
        - Gardening with your mentor? (for local participants only)
        - With the workshop presentations and guest speakers?

Gardening Identity

7. You mentioned that you view yourself as an identity descriptor from #1 (ex. Outdoor lover, baker, vegetarian etc.). How has this gardening experience helped you connect or disconnect with that identity?

8. In your own words, what does being a "gardener" mean to you?

9. In your pre-workshop survey, you gave yourself a ___ out of 5 in your gardening background.
    - Having completed these gardening workshops, how would you rate yourself now (1-5)?

10. Now I want to spend some time reflecting with you on both positive and negative experiences with gardening.
    - When did you most feel like a gardener? "Hey, I'm doing this! I'm actually growing something! (or incorporate responses from Q8)
    - When did you least feel like a gardener?

Personal Learning and Achievement Goals

11. Earlier before the workshops, you shared that the **learning or achievement goals** you had for yourself through these workshops, as _____.
    - Do you have any new goals for yourself after the workshops?

12. As a result of participating in these workshops and gardening, have you noticed any changes in the way you cook, try new foods, or shop for groceries, etc?

13. Now that you've completed this gardening experience, would you be interested in continuing to garden after these workshops? Why or why not?
    - If given the opportunity to garden at your own plot with other students on campus, with free access to tools and additional workshops, would that change your decision?

D. Other resources from Gardening 101

In this G101 Executive Summary, you can find more detailed information about the project design, implementation, and evaluation, as well as student feedback and a list of documents pertaining to the project and workshop. The rest of the workshop's curriculum, lesson plans, and outline of the 6-week workshop topics can be found at this G101 curriculum spreadsheet.

E. Nvivo Codebook

Code	Sub-code(s)
Agency	
Appreciation	
Community	Interconnectedness
Connection to…	History
	Past memories
Food choice & lifestyles	Behavioral changes with food
	Chemical-free preference
	Eating healthy
	Grocery shopping
	Growing your own food
	Reducing waste
	Self-sufficient
Gardening Identity	Connection to nature
	Continuity
	Identity Shift
	Knowledge
	Success
Goals (with gardening)	Learning Goals from workshop
Hands-on (preference / experience)	
Helping (desire)	
Intersections	Personal Identity characterizations (icebreaker)

Code	Sub-code(s)
Knowledge sharing	from social media
Level of Confidence	Confident
	Not Confident
Level of Interest	
Interest…	in growing plants
	in trying new foods
	Situational interest (vs. longer-term interest)
Motivation for behavioral change	COVID-lockdown related
	for end results
	to meet the needs of “other”
	to be sustainable
	to research or learn more about gardening
	Try something new
Observations of plants	
Opportunity	Barriers
Practice-Linked Identities	
Pride	
Reflection	
Relationships with…	
w culture	Connect / Disconnect
w farm workers	
w food	Connect / Disconnect

Code	Sub-code(s)
w gardening	Connect / Disconnect
w God and spirituality	
w nature	Connect / Disconnect
w other gardeners or producers	
w people	
w place	
w plants	
w self	
w work	
Identity Resources	
Ideational Resource	
Learning moment	
Material resource	
Relational resource	
Resource interactions	
Time and seasons	
Workshop Evaluation	