

# ADELANTE

A Journal of Student Research and Creative Work



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*¡El querer es poder!*  
*Where there's a will,*  
*there's a way!*

# Adelante: A Journal of Student Research and Creative Work

## Volume 4: Fall 2024



California State University **Chico**  
Graduate Studies

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# Acknowledgements



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We acknowledge and are mindful that Chico State stands on lands that were originally occupied by the first people of this area, the Mechoopda, and we recognize their distinctive spiritual relationship with this land, the flora, the fauna, and the waters that run through campus.

We are humbled that our campus resides upon sacred lands that since time immemorial have sustained the Mechoopda people and continue to do so today.

## Origins

The *Adelante\* Journal of Student Research and Creative Work* showcases the breadth and diversity of Chico State undergraduate and graduate student research and creative work. The Office of Graduate Studies is excited to present this fourth edition. The idea for the journal grew out of our desire to provide examples of student work that demonstrate a wide array of methods, styles, and diverse voices. We hope the journal inspires more students to engage in research and to pursue opportunities to present and publish their work in this journal and beyond. We also wanted to include shorter pieces that allowed all student researchers to share at least some part of their work publicly. For this reason, we encouraged students to submit abstracts that captured their research and creative work.

Journal funding and support is provided by the Office of Graduate Studies and Adelante, a Postbaccalaureate Pipeline program funded by the U.S. Department of Education Developing Hispanic-Serving Institutions Title 5 grant (\$2.9 million). The Adelante program's core mission is to support Latinx and low-income students at Chico State in exploring, preparing for, applying to, and successfully attaining graduate degrees and teaching credentials. It is a multifaceted program that includes: a graduate student ambassadors outreach program, where information about graduate education is provided to undergraduates; a peer-plus mentoring program, where graduate students mentor undergraduates; and a summer research program that pairs undergraduate and graduate students with faculty mentors to conduct research.

\*Note: "*Adelante*" is Spanish for "Onward, Ahead, Forward!"

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# STUDENT PAPERS

## Jibun Ga Nai

# An Exploration of the Concept of the ‘Self’ in 1970s Japan as Evidenced in Language

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In the beginning of her 1990 anthropological work “Crafting Selves: Power, Gender, and Discourses of Identity in a Japanese Workplace,” Japanese cultural anthropologist Dorinne Kondo recalls the first time she was struck with an awareness of a key difference between the American conception of the ‘self’ and that of the Japanese. She describes her feelings of being “bound by chains of obligation,” forced to comply with requests and solicitations which she felt she could not refuse and “still be considered a decent human being.” She recounts the story of how she had one day complained bitterly to her landlady about these feelings, which she was experiencing particularly intensely because of an interaction she’d had with a local teacher who recently asked a favor of her which she felt she did not have the time to indulge. Her landlady replied that the teacher had been “happy to give of his time to help ... and by the same token he considered it natural to make requests of others, who should be equally giving of themselves, their ‘inner’ feelings notwithstanding.” The landlady continued, “‘*Jibun o taisetsu ni shinai no, ne*’ [The Japanese don’t treat themselves as important, do they?]” (Kondo 1990:22).

The Japanese, says Kondo, value the maintenance of good relations with others much more than their own feelings. “Persons seemed to be constituted in and through social relations and obligations to others. Selves and society did not seem to be separate entities; rather, the boundaries were blurred” (Kondo 1990:22). Elaborating on this idea, Kondo continues with a critique of western anthropological writing on the idea of the self:

In anthropological literature, the conventional assumptions of the presence and unity of ‘the self’ and the use of the self/society binary as a foundational point of departure are reinscribed through rhetorical strategies which emphasize the referential meaning, decontextualized examples, and totalizing narrative closure. That one can even talk of ‘a concept of the self’ divorced from specific historical, cultural, and political contexts privileges the notion of some abstract essence of selfhood we can describe by enumerating its distinctive features. The invocation of ‘culture and self,’ ‘a concept of self,’ or a notion of ‘person’ links up with static essentialized global traits where selves can be discussed as a category quite separable from power relations (Kondo 1990:36).

Kondo takes issue with anthropological writings concerning the self for the same reason that Peirce takes issue with Saussure’s conception of the dual nature of the sign. Kondo argues

for an acknowledgement of the existence and importance of Peirce's *interpretant* when considering what it means to have a self in society. Rather than affirming the existence of a self as a 'transcendent signified,' a 'thing in itself,' she sees the assumption of a divided self/society as privileging certain viewpoints as objective and 'scientific.' Western viewpoints especially, she says, assume an indivisible self which is set apart from any group affiliation. This assumption she sees as coded into anthropological literature through "rhetorical strategies," by which she means the deliberate use of language to influence the reader so that they might interpret the author's viewpoint as privileged and objective. Citing Peirce, Kondo suggests that the self cannot be assumed to be static, measurable, or indivisible. "Proper use of Japanese," says Kondo, "teaches one that a human being is always and inevitably involved in a multiplicity of social relationships. Boundaries between self and other are fluid and constantly changing, depending on context and on the social positioning people adopt in particular situations" (Kondo 1990:31).

One area where the blurred line between self and society is particularly evident is in the formation of Japanese social structures. Japanese cultural anthropologist Chie Nakane, writing in the 1970s, investigated the history of Japanese social structures in an effort to better understand them and, by extension, the culture to which they belong. The archaeological record, he says, tells us that during the Jomon period, from 15,000 to 300 BC, Japanese culture began homogenizing, becoming more uniform in its cultural expressions. During that time, and before the beginning of the historical period beginning in the fifth century A.D., the nature of social structure took its definitive form, and has, he says, remained largely unchanged at its foundation. Village occupants during those years formed self-reliant groups stratified by seniority, and fulfilled various roles and responsibilities based on the needs of the group. These needs were paramount, and village harmony depended on consensus agreements among its members. For this reason, conformity and group identity were always key aspects of Japanese culture (Nakane 1970: 141).

Great weight was placed on a person's duration of residency and generational tenure, so that seniority tended to far outweigh things like quality of task performance. It was necessary for some group members to specialize, since the village relied almost entirely on its own residents for meeting its needs, but specialists were not usually afforded a higher status. A skilled craftsman arriving from an outside village would be met with coldness and hostility until he had 'done his time' and contributed to the village community for a considerable duration. However, he would eventually be accepted in and could count on a secure and steady advancement in rank over time. He could, then, also count on his eventual acceptance and integration within the community and an accumulation of respect and appreciation, but only with time and within that particular community (Nakane 1970:115).

Japanese society was built on the principle of locality, and individuals were ascribed value not based on inherent characteristics such as lineage or place of origin, but by their current group-affiliation and the rank accrued by extension of group affiliation. Though a tradesman may once have lived in another village and belonged comfortably to another group, he would have been extremely unlikely to be accepted warmly back into his old group after leaving and would instead likely have been met with coldness and hostility (Nakane 1970:115).

This principle of group affiliation created a Japan that was essentially an amalgamation of relatively homogenous villages in competition with one another and sustained by rigid group-affiliation. The group member could count on having their emotional and physical needs met by nature of the essential interdependence of members of their own group. It did not matter where

one had come from or what inherent characteristics they had; they were certain to receive acceptance and place among peers so long as they were willing to participate in the social system. Group membership was expected to be a life-long commitment. Entrance into the social system meant joining at the bottom but also promised advancement of rank, and thereby security and fulfilment for life in exchange for participation. This naturally entailed a considerable loss of personal autonomy.

Villages relied on consensus systems that operated on a principle of unanimous decisions, which were to be reached at any cost. Voicing opposition, then, meant risking ostracization and ejection from the group. Opposition of this kind implied immense risk to the village, as it was viewed as threatening to group stability and therefore the wellbeing of its members. Not even leaders had particularly privileged status in decision making, and one could not ever achieve high enough rank to ignore the group equilibrium or consensus system. The ultimate feeling was that, whether you were of high rank or low, your private and public life were constantly intertwined with the group (Nakane 1970:115).

As Nakane describes it, the same principles apply to 1970s Japan, though the dominant feeling of group affiliation has transferred from the village to the *uchi* (うち). “The term *uchi* describes a located perspective: the ‘in-group,’ the ‘us’ facing outward to the world. *Uchi* defines who you are, through shaping language, the use of space, and social interaction. It instantly implies the drawing of boundaries between ‘us’ and ‘them’” (Kondo 1990:141) (Emphasis added).

*Uchi* is expressed through language and shapes the identity of the addresser as well as the identity of the addressee, and it is entirely context-dependent. It informs the participants in the speech act about the nature of the interaction taking place. The identity of the interlocutors is negotiated fluidly, and “these multiple, infinitely graded layers of selfhood are often described in terms of two end points of a continuum: the *tatemaie* (建前), ‘social surface,’ that which is done to smooth social relations, and *honne* (本音), ‘real’ feeling; *omote* (表), the front, formal side, vs. *ura* (裏), the back, or intimate side; *soto* (外), outside, and *uchi*, inside” (Kondo 1990:31). The existence and popular use of these terms in the Japanese language suggests a particular sensitivity of the Japanese toward these divisions.

According to Kane, the Japanese man may express his *honne*, his ‘real feeling,’ privately with members of his *uchi* with whom he is really very close, but there may be members of his *uchi* with whom he would rather present his *tatemaie*, a surface-level presentation lacking the depth and warmth of *honne* but more suited to achieving harmony within a social situation. In formal meetings with *soto* (those felt to lie outside the *uchi*), one would be much more likely to present his *omote* (front, formal side), while back at his workplace or at the bar, among his close friends, he may feel it natural to present his *ura* (back, intimate side).

The *uchi* extends across the organization, but despite a general and strong feeling of group affiliation, interpersonal relationships within the group are organized on a one-to one basis. The individual working man feels himself a part of the group, and within the group he begins to form a close attachment with a particular higher-ranking individual. At the highest rank within his *uchi* one is likely to find a charming leader, an *oyabun* (親分), a man who finds himself in a position of authority by nature of his tenure in the organization and his ability to procure vertically stratified relationships with lower-ranking individuals, *kobun* (古文), within the organization. *Kobun* of lower rank are attracted to the charming qualities of their superior

and seek to engage in a reciprocal, but still vertically stratified, relationship. The traditional relationship between patron and client, landlord and tenant, and master and disciple, are all built on the *kobun-oyabun* principle. “Oyabun means the person with the status of *oya* (親) [parent] and kobun means with the status of *ko* (子) [child] ... The essential elements in the relationship are that the kobun receives benefits or help from his *oyabun* ... the *kobun*, in turn, is ready to offer his services whenever the *oyabun* requires them ... the *oyabun* plays the role of the father” (Nakane 1970:42) (Emphasis added).

A man who is oyabun to one may be kobun to another, and the group structure takes on the form of cascading vertical relationships, all of which link back ultimately to one individual at the top. The rank of one man within the group is readily calculated by comparison with those above and below him in the ladder of vertical relations and is made apparent through speech. The varying degrees of formality evident in all instances of speech acts between Japanese are expressed through the use of specific honorifics and morphemes. “Japanese ‘linguistic ideology’ (Silverstein 1979) directs attention to levels of hierarchy, intimacy, distance, and contextuality” (Kondo 1990:31). The use and frequency of these morphemes and honorifics within a particular speech event are indexical of the degree of distance in rank between the addresser and the addressee engaged in the act of verbal communication. A statement addressed to an inferior would be much shorter than one expressing the same information but addressed to someone of higher rank (Bergamini 2014).

The feeling of closeness that develops between an oyabun and his kobun is expressed indexically through the softening of such verbal formality. It is extremely disturbing for a Japanese person, says Nakane, to be confronted with formal language suddenly from a person who knows them quite well and with whom they thought themselves close (Nakane 1970). Between oyabun and kobun there usually develops a mutual allowance for expression of personal emotion and informality, which is not meant for public scrutiny. In formal meetings with *soto*, outsiders, a kobun will always defer to his oyabun and treat him with reverence, while the situation may be reversed at times behind closed doors. Though the kobun certainly depends on his oyabun, it is also the case that the oyabun depends on his kobun, and a sympathetic appreciation for and serious consideration of the thoughts and feelings of his underlings is expected of the kobun. Among employees of his same entry year (the only people with whom he can consider himself on equal footing) there is generally a feeling of hostility and competition for the attention and favor of the oyabun, generally masked or unexpressed for the sake of group cohesion (Nakane 1970).

The *oyabun-kobun* verticality and the competition for primacy is mirrored in the organization of ‘parent’ companies and their ‘child’ companies, which are stratified vertically by one-to-one relationships and yet constitute one collective, closed-circuit group, one *uchi*.

It is usual ... for a large business firm or industrial plant to attach to itself a considerable number of affiliated and subordinate companies, many of which are called its ‘child-companies’... It is very interesting to note that these relationships, called parent-child by the Japanese, between modern industrial enterprises are identical in structure with those between traditional agricultural households on a landowner-and-tenant basis in rural Japan (Nakane 1970:96).

It seems, then, that an organizational principle in terms of parent-child relationships constitutes the basic scheme of Japanese organization. This principle is to be found in almost every kind of institution in Japan ...” (Nakane 1970:96).

Nakane suggests that social structures in Japan are built on sociological principles, and not, as one might assume, economic ones. The group fulfils the emotional, physical, and psychological needs of its *uchi*, and its economic survival is understood to depend on the success of the provision of these needs. A westerner, Nakane says, is often perplexed by the lengths a company will go to in order to provide for the needs of its members and their families. That is why it is charming and sympathetic leaders in top positions at Japanese companies and not, usually, extremely skilled and specialized workers. As in the villages described by Nakane, specialization is still necessary for some within the modern Japanese organization, but for most, the vagueness of roles required of a given employee stands in stark contrast to the rigidity of the ranking system. Most employees will fulfil a large number of jobs in their tenure at the organization. It is accepted that everyone in the group will do what they can to meet the requests of their superiors to the best of their ability, and that is enough. The result of these expectations and arrangements is that, just as in the village, a strong but rigid group identification is formed, built on systems of mutual interdependence, rank, and mandatory consensus.

The group achieves a harmonious independence from other groups, having established its own norms, meanings, and values upon which to operate and which all members will subscribe to and enact or else risk expulsion from the ‘closed world.’ Since rank is based on seniority and individual merit is of little concern, even a top executive who has left one company will almost always find himself having to enter at the very bottom of the social hierarchy of his new institution. As a result, expulsion from the group is dreaded, and membership is, as mentioned earlier, expected to be lifelong. “In virtue of the sense of unity fostered by the activities and emotions of the group, each member is shaped to more or less the same mould, and forced to undergo the kneading effects of group interaction whether he likes it or not ... Even if individuality is not entirely submerged, at the very least the chances of cultivating it are very strictly limited” (Nakane 1970:131).

Inside the *uchi*, for the price of a stifling individuality, the employee’s needs are valued and provided for, but “there is no necessity for positive relations with other groups; instead, relationships tend to be competitive or hostile. ... The entire society is a sort of aggregation of numerous independent competing groups which of themselves can make no links with each other: they lack a sociological framework on which to build a complete integrated society” (Nakane 1970:102). The average worker’s social contacts do not extend past their place of work.

In 1973, Japanese psychologist Takeo Doi proposed a three-tiered model of the social world of a Japanese person, consisting of three concentric circles. In the inner-most ring he places the individual and their closest friends, colleagues, and relatives, people they could express their *honne* to. This inner ring is very similar to what we have so far referred to as the *uchi*. In the second circle, he places people with whom one has relationships built on *giri* (義理), socially contracted interdependence; these are people such as neighbors, coworkers to whom one is not familiar, individuals on whom one has relied for help and so incurred some kind of implied debt, and *soto* from other companies with whom one must interact for the benefit of one’s own organization. In this second ring, one has to exercise *enryo* (遠慮), or ‘social constraint.’ In the



outermost circle are placed the *tannin* (担任), strangers with whom one does not have any business. One need not exercise enryo with tannin, because good graces of tannin are totally irrelevant to the success and proper functioning of the uchi. The gauge for judging whether someone is dealing with an insider or outsider, for Doi, is the degree of enryo on display in an interaction.

Within both the innermost circle, the uchi, and the outermost circle, the tannin, one would not be likely to exercise a high degree of enryo. Enryo is essentially the withholding of informality, sincerity, and sympathy. It is the distance deliberately maintained through the use of honorifics and special morphemes between two individuals engaged in vertical dialogue with one another, individuals performing their omote, the reverse of the familiarity that is desired between oyabun and kobun. There isn't really a western equivalent for the word enryo, and Doi, citing Whorf, suggests that this is evidence of a particular sensitivity of the Japanese toward the concept expressed by it. "The forms of a person's thoughts are controlled by inexorable laws of pattern of which he is unconscious. These patterns are the unperceived intricate systemizations of his own language—shown readily enough by a candid comparison and contrast with other languages, especially those of a different linguistic family. His thinking itself is in a language—in English, in Sanskrit, in Chinese. And every language is a vast pattern-system, different from others, in which are culturally ordained the forms and categories by which the personality not only communicates, but also analyses nature, notices or neglects types of relationships and phenomena, channels his reasoning, and builds the House of his consciousness" (Whorf 1956:252).

Doi's exploration of *amae* (甘え) was shaped less on the practices and ideas of western psychologists and more on the writings of Edward Sapir, Wilhelm von Humboldt, and Benjamin Whorf, and his exploration of enryo comes as part of a larger exploration of what he called 'the vocabulary of *amae*,' a Japanese word denoting an emotion that he suggests is common to all of humanity but absent from the vocabularies of Westerners.

Doi suggests that the absence of a word equivalent to *amae* corresponds with a lack of cultural sensitivity to its meaning in Western countries. The concept evoked by *amae*, he says, to those with knowledge of its meaning and a familiarity with the Japanese language, can help to understand the shape of Japanese social structures as outlined to this point. "The emphasis on vertical relationships that social anthropologist Nakane Chie recently stipulated as characteristic of the Japanese-type social structure could also be seen as an emphasis on *amae*" (Doi 1973:28) (Emphasis added).

To understand what Doi is getting at, it is important to understand the role of women in 1970s Japan, which was also heavily influenced by traditional gender roles. The expected life-trajectory for a woman in Japan is to end in marriage to a good organization man, with whom one would raise children. The focus of this essay to this point on the organization man and his involvement with his group was done in part to illustrate a lack of involvement in the home. Nakane says that the married Japanese woman was happy to have her husband out of the house. Doi writes that at one time in Japanese history, "husband and wife were basically *tannin* [strangers]" (1973:36). Thus, the typical role adopted by the married Japanese woman was that of mother to her child rather than wife to her husband. "This is the traditional pattern, little affected by post-war change. The core of the Japanese family, ancient and modern," just like the core of Japanese social structures, "is the parent-child relationship" (Nakane 1970).

Married working men in Japan are described by Nakane as being much closer with their coworkers than with their wives or children. Of the considerable popularity of bars in Japan for organization men, Nakane says that “Japanese men enjoy informal talks with friends in bars or restaurants rather than at home ... A bar has a function of its own, which cannot be replaced by home or mistress. ... Conversation over drinks has a significant function for Japanese men, who are rather slow to speak out on formal occasions and feel considerable pressure from the rigid vertical system ... here they can find complete relaxation and can talk and laugh from the heart” (Nakane 1970:125). According to Nakane, it is understood that in Japan, what is said when drinking among friends is not to leave the bar, that is, not to be brought up or held against a person later on.

Throughout their workdays the organization men must keep personal opinions, thoughts, and emotions tightly suppressed, and as a result they must exercise a constant, delicate sensitivity to the needs, feelings, and ranking of others. The popularity of bars reflects the feeling among Japanese organization men that these are the places to soothe the nerves by opening up to close friends or bar maidens with whom one does not feel they must exercise taxing enryo, social constraint. The home is seen as a place for rest, and not a place for connection of this kind (Nakane 1970:126).

Now we can begin to understand why Nakane says that “in society the wife tends to be shut out from any social activities and her attention is directed to her own children. The mother’s excessive care for her children is often found fault with by social critics; but this phenomenon is closely linked with the situation facing women in the newly established and developing communities where most organization men make their home. The wives and mothers lack access to any means of extending their social activities; they live far away from parents, brothers and sisters, and schoolfriends” (Nakane 1970:127).

Bereft of other channels through which to form a traditional uchi, Doi suggests that the mother naturally forms a one-to-one vertical relationship with her child, just as her husband does with his organization, an uchi complete with the surprising tolerance, closeness, involvement, support, and sympathy from the oyabun (the one with the status of parent), and the reverence, deference, and mutual support from the kobun (the one with the status of child).

Reflecting on his return home from time spent in the United States, recalling that he “came back to Japan with a new sensibility,” he writes that “from then on the chief characteristic of the Japanese in my eyes was something that ... could best be described as *amae*” (Doi 1973:15). *Amae* is nothing other than the act of relating to another on the basis of an expectation of deference, sensitivity to one’s needs, appreciation, sympathy, indulgence, and care, the likes of which one hopes to receive as a child from one’s caregiver. Where Nakane says that “the *oyabun* plays the role of the father” (Nakane 1970:42), Doi might suggest, rather, that the *oyabun* plays the role of the mother, given the comparatively limited role of the father in the Japanese child’s life. He characterizes *amae* as the opposite of *enryo*, the taxing social restraint exhibited by the Japanese in formal situations and evidenced in their careful use of indexical language. “The word *amae* itself is far from being an isolated expression of the *amae* psychology in the Japanese language. A large number of other words give expression to the same psychology” (Doi 1973:28). Below I have included a list of some of these Japanese words for which English equivalents do not exist.

*Amae: Presumed indulgence.*

*Amaeru*: To assume the good will of others; to depend and presume upon another's benevolence.

*Giri*: Socially contracted obligation.

*Hohitsu*: To assist, with an implication of shouldering all actual responsibility while conceding all apparent authority.

*Moshiwake nai*: "I have no excuse;" an expression of a desire to be forgiven even though the relationship is not one where amae would normally apply.

*Sumanai*: An expression of guilt (generally incurred by the feeling that one has betrayed the group) with the implication that one has not done everything one should have done. Sumanai is most often associated with relationships of giri. ("Sumanai is used as a means of holding onto the other's good will.")

*On*: Incurred kindness which establishes giri.

*Nakamauchi*: "Circle of friends or colleagues." (Generally referring to the group to which one belongs.)

*Shinyu*: Close friend with whom one need not exercise much enryo and on whom one can presume amae.

(Doi 1973)

In all these words, one can see reflections of the social structures described by Nakane and the ideology which had shaped them. What should also be clear by now is the preoccupation with maintenance of good relationships with others, described by Kondo as far outweighing what is experienced as the individual's 'true' feelings, and its relationship with the concept of the 'self' apart from society in the West. Doi, too, describes a close connection between amae and the awareness of 'self' expressed by the Japanese word *jibun* (自分), used by Kondo's landlady in her musings about the lack of care exhibited by the Japanese for their 'true' feelings. Doi describes the word *jibun* as being rich in implications, "quite different from the abstract feel of words such as *jiga* (自画) and *jiko* (事故) that are used to translate the Western concepts of 'self' and 'ego.' It is this that makes possible phrases such as *jibun ga aru* (he has a self), and *jibun ga nai* (he has no self)."

Returning to the statement of Kondo's landlady at the beginning of this essay, "*Jibun o taisetsu ni shinai no, ne*" [The Japanese don't treat themselves as important, do they?] (That is, they spend time doing things for the sake of maintaining good relationships, regardless of their 'inner' feelings)" (Kondo 1990:22), we can begin to understand why it is that Doi later says that his patients who reportedly "did not *amaeru* much," could not engage in reciprocal, vertical relationships characterized by the expectation of mutual deference, sensitivity to one's needs, appreciation, sympathy, and care, and often experienced a diminished capacity for a coherent sense of self.

The development of a sense of self, a *jibun*, in Japan is dependent on the capacity of the individual to engage in relationships built on amae, presumed indulgence (Doi 1973). Since before the beginning of Japan's historical period in the fifth century A.D., it was precisely this

type of relationship which was promised to the individual willing to commit to a lifelong group-affiliation in which the line between self and society was blurred (Nakane 1970). When Kondo takes issue with the assumption at the heart of the Western anthropological preoccupation with the concept of the 'self' as a 'transcendental signified,' she does so for the reason that it assumes the universality of a culture-bound and language-bound framework for understanding the human experience. It is through the Japanese lexicon, through common terms like those expounded upon in this essay, that one can begin to understand the workings of Japanese culture at a micro and macro scale. "The [Japanese] language comprises everything which is intrinsic to the soul of [the] nation" (Doi 1973:15). Recalling a conversation with one patient's mother, Doi recalls the moment the English woman suddenly switched from English to Japanese to say "*kono ko wa amari amaemasen deshita*" [she did not amaeru much], "she kept to herself, never 'made up to' her parents, never behaved childishly in the confident assumption that her parents would indulge her." When he asked her why she had switched to Japanese for that single sentence, she replied, "There's no way of expressing it in English" (Doi 1973:28).

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# Stress, Confidence, and Resilience of Graduate Students in Communication Sciences and Disorders

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**Abstract:** Graduate students in Communication Sciences and Disorders (CSD) programs face significant mental health challenges that impact their academic performance and overall well-being (Allen et al., 2021; Bogardus et al., 2022; Bullock et al., 2017; Coffman et al., 2019; Delaney et al., 2015; Ellis & Briley, 2018; Malandraki, 2022). This literature review examines the prevalence and impact of stress, burnout, and resilience among these students. Recent research suggests that high levels of stress experienced by CSD graduate students are due to rigorous academic and clinical demands. Elevated stress is associated with burnout, characterized by emotional exhaustion, cynicism, and inefficacy, which adversely affect both academic and professional performance. Findings suggest that poor sleep quality exacerbates burnout, while improving sleep quality may help mitigate its effects. Resilience, defined as the ability to adapt and thrive despite adversity, has emerged as a crucial coping mechanism. This review underscores the need for targeted resilience programs to support CSD graduate students. Such programs should focus on building reflective ability, emotional intelligence, social confidence, and social support through practical strategies like wellness check-ins, peer counseling, and resilience training. To enhance the reliability of research in this area, future studies should include a diverse sample of students across the country and utilize larger, randomized trials to ensure broader applicability and reliability of findings.

**Keywords:** *graduate students, resilience, burnout, stress, communication sciences and disorders*

## 1. Introduction

Mental health and well-being are critical factors that influence graduate students' (GS) academic performance, professional conduct, and overall quality of life. Recent research highlights the prevalence of burnout among these students (Malandraki, 2022). Burnout is defined as emotional and physical exhaustion resulting from exposure to stressors, compounded by inadequate coping mechanisms (Bullock et al., 2017). Burnout not only impedes students' psychological abilities but also detrimentally impacts their academic performance. Additionally, the concept of resilience, characterized by the capacity to adapt and thrive despite adversity, has gained prominence as a vital attribute for managing stress and enhancing professional performance (Coffman et al., 2019; Delaney et al., 2015; Malandraki, 2022). There are a multitude of studies that underscore the importance of resilience programs in clinical education. They propose that fostering resilience through targeted strategies (e.g., faculty mentoring, therapy, stress management seminars, periodic mental health assessments, self-care activities, program related resilience support groups, pass/fail

grading systems, and adjusted course loads) can mitigate the negative effects of stress and burnout (Bogardus et al., 2022; Malandraki, 2022; Findley, 2024; Lieberman et al., 2018; Beck et al., 2020; Ellis & Briley, 2018; Delaney et al., 2015). This literature review aims to address the important themes of stress, confidence, and resilience of GS in CSD programs and how to support and improve these variables for GS.

## **2. Student Stress**

Stress is a common experience, particularly in academic environments where students face numerous pressures. Beck et al. (2020) define stress as a disruption of the body's homeostasis, triggered by various external and internal factors. College students are especially vulnerable due to the transitional nature of college life, the pressure to maintain high academic standards, and financial burdens (Lieberman et al., 2018). Recent studies have highlighted that students in CSD programs face unique stressors that had been underexplored until recently, making it difficult for them to anticipate and cope with these challenges (Lieberman et al., 2018).

GS in speech-language pathology (SLP) programs encounter even greater academic and clinical demands than their undergraduate counterparts. These demands often include heavy workloads, rigorous courses, and the start of clinical practice (Lieberman et al., 2018). SLP GS face additional stressors such as test-taking fears, practicum requirements, and financial pressures. The clinical scope and range for students in SLP practicums are continually expanding, requiring a strong understanding and application of research methods alongside challenging coursework, exams, and externship placements (Lieberman et al., 2018; ASHA, 2016). The intense stress associated with these demands has been linked to higher dropout rates among students, prompting universities to adopt supportive measures, such as providing greater social, administrative, and financial resources, to enhance retention (Lieberman et al., 2018).

Elevated stress levels are a major concern in clinical training programs, as they are associated with poor performance in tasks requiring high levels of focus, memory, and decision-making (Ellis & Briley, 2018). First-year GS primarily reported stress due to adjusting to greater academic and clinical responsibilities, with 80% citing these as significant issues (Ellis & Briley, 2018). Time management and financial obligations were also significant stressors. For second-year students, 50% experienced stress from academic and clinical duties, as well as from planning for externships, graduation, and managing finances and personal health (Ellis & Briley, 2018). Stress levels increased for 93% of first-year students and 87% of second-year students since enrolling (Ellis & Briley, 2018).

Mental health issues, such as anxiety, depression, perfectionism, and suicidal ideation, have become increasingly prevalent and severe among GS, particularly those in health science fields (Bogardus et al., 2022; Coffman et al., 2019; Delaney et al., 2015; Findley, 2024; Malandraki, 2022). This increase is largely due to numerous stressors such as the cost of education, clinical practicum demands, exams, rigorous coursework, licensure exams, and the transition to adulthood (Bogardus et al., 2022). Researchers have expressed concern that mental illness and perfectionism could negatively impact health science students—such as SLPs, physician assistants, occupational therapists, and physical therapists—as the cognitive and behavioral consequences of these conditions may impair learning, coping abilities, and the completion of both didactic and clinical

portions of their programs (Bogardus et al., 2022). While some evidence suggests that graduate programs may exacerbate or create new mental health issues, concrete evidence remains lacking. The study recommended that the structure of graduate programs could significantly impact students' mental health and well-being. Previous research indicated that students often do not reach out when stressed, viewing it as "an admission of failure" (Beck et al., 2020). Therefore, it is up to instructors and faculty to create a safe space for students, guide them through the program, and offer resources or integrate mental health supports into the curriculum.

### **3. Burnout**

Burnout is a significant risk in healthcare professions, particularly among GS (Coffman et al., 2019). It is defined as emotional and physical exhaustion resulting from exposure to stressors, compounded by inadequate coping mechanisms (Bullock et al., 2017). The high demands for academic and clinical performance before and during graduate training place students at an elevated risk for anxiety and depression (Bogardus et al., 2022; Delaney et al., 2015; Malandraki, 2022). CSD students, in particular, report substantial stress from various life factors affecting their academics, including general stress, poor sleep quality, limited access to nutrition, decreased physical activity, lack of self-care, and worsening mental health conditions (Allen et al., 2021; Beck et al., 2020; Coffman et al., 2019; Findley, 2024; Lieberman et al., 2018).

Coffman et al. (2019) found that CSD students experience stress in multiple areas, such as personal life, food insecurity, and financial concerns. Despite reporting effective stress management compared to their general college peers, these students also reported not feeling rested most days and experiencing more sleep deprivation than the general student population. Allen et al. (2021) suggested that sleep could play a crucial role in the link between stress and burnout, although these relationships were not well explored among GS until recently.

Allen et al. (2021) classified burnout into three dimensions: exhaustion, cynicism, and inefficacy. Exhaustion refers to fatigue due to emotional resource depletion. Cynicism refers to a negative or indifferent attitude towards one's work. Inefficacy relates to feelings of incompetence and a lack of accomplishment. Allen et al. (2019) conducted a survey examining the impact of sleep on burnout among graduate students, finding a strong association between increased stress and burnout, especially in terms of exhaustion, followed by cynicism and inefficacy. The study also suggested that burnout might be reversible, with sleep quality acting as a potential buffer. Specifically, poor sleep quality was linked to higher levels of burnout, while sleep duration showed a less consistent relationship. The findings indicated that improving sleep quality, rather than duration, might be more effective in reducing burnout.

Bullock et al. (2017) investigated the prevalence of burnout and its effects on the psychological, professional, and academic performance of graduate healthcare students. Reviewing 127 articles across five domains—etiology, professionalism, mental health, empathy, and academic performance—the authors found that burnout was prevalent among health science GS and had significant negative impacts. The study revealed that lack of support from school, family, or friends was a major contributor to stress and burnout, which often led to unprofessional behavior. Furthermore, the mental health aspect of the study highlighted a strong correlation between



burnout and issues like depersonalization and emotional exhaustion, particularly in schools with grading scales, suggesting that pass/fail grading systems might better support students' mental health.

#### **4. Resilience**

Research conducted by Malandraki (2022) discussed the profound impact that graduate school has on the mental well-being of students, particularly those in CSD programs. While research on resilience has existed for years, it has only recently become a focus for graduate programs. According to the author, emotional resilience has been highlighted since 2020, but its findings have seen limited application in curricula (Malandraki, 2022). Developing emotional resilience is crucial as it can be a strong coping mechanism for burnout and compassion fatigue. Symptoms of compassion fatigue include experiencing a sense of hopelessness, mood swings, irritability, anxiety, substance abuse, anger/resentment, poor concentration, digestive issues, sleep disturbances, headaches, increased muscle tension, and fatigue. Resilience requires active engagement in self-care strategies, which should be promoted by faculty or mentors throughout the program to reduce professional challenges and minimize clinical errors, apathy, anxiety, and depression (Coffman et al., 2019; Delaney et al., 2015; Findley, 2024; Malandraki, 2022). Malandraki (2022) details how professional challenges, burnout, and compassion fatigue can extend from graduate school into professional work, emphasizing the need for proper coping mechanisms to maintain professional wellbeing.

Malandraki (2022) highlighted the need for more detailed research on this topic but notes that the current data shows a clear demand for the implementation of mental health practices by clinical educators (CEs) and other influential staff. At this time these issues are not addressed in the Council on Academic Accreditation standards or in the literature on clinical supervisor training in speech-language pathology (ASHA 2013; ASHA, 2020; Malandraki, 2022). Emotional resilience is essential for health science professionals who often absorb patient stress and trauma, with high resilience levels associated with lower burnout and compassion fatigue. Positive impacts of addressing emotional resilience have been noted at both graduate and undergraduate levels in various fields of health science, including nursing and social work.

Evidence suggests that four competencies—reflective ability, emotional intelligence, social confidence, and social support—should be collectively and intentionally addressed to improve emotional resilience in SLP graduate programs. This can be achieved through weekly wellness check-ins, regular wellness activities, clinical wellness journal reflections, peer counseling sessions, and clinician panels sharing experiences about difficult cases. Implementing these practices can enhance the mental well-being and success of SLP students. While further research is needed to measure the overall impact of these interventions, the current data is the most supportive available on the topic at this time.

Findley (2024) investigated the associations between self-care practices and clinical self-efficacy in SLP GS students. Using a non-experimental design, the author employed descriptive and correlational methods to analyze data from a survey completed by 68 GS. The survey questions measured engagement in various self-care practices (e.g., mindful relaxation, physical care, self-

compassion and purpose, supportive relationships, supportive structure, and mindful awareness) and clinical self-efficacy in different areas (e.g., pediatric, adult, assessments, treatment, and overall efficacy; Findley, 2024). The data showed that students engaged more in supportive relationships and structures compared to mindful relaxation, physical care, self-compassion, and mindful awareness. They rarely engaged in relaxation techniques like yoga or creative activities, with the highest engagement being spending time with supportive individuals who respected their choices and listened when they were upset. These findings suggest varying levels of participation in different self-care domains. The study found small positive correlations between supportive structures, supportive relationships, mindful awareness, and clinical self-efficacy. Supportive relationships and mindful awareness were highlighted for reducing student stress and enhancing clinical self-efficacy through mindfulness interventions, boosting students' confidence in clinical settings.

Delaney et al. (2015) highlighted resilience as a valuable coping strategy for learning and professional practice. Clinical education, a crucial component of health professional training, was also a time of peak stress and burnout for students. Their coping and perception of stress significantly impacted their clinical and professional behavior, raising concerns for educators. Students with negative coping strategies required more teaching time and resources (Delaney et al., 2015). Stress affected them physiologically (e.g., headaches), psychologically (e.g., anxiety), and behaviorally (e.g., difficulty concentrating). Resilience, defined as an adaptive, stress-resistant quality, allowed students to thrive despite adversity (Delaney et al., 2015). “Academic buoyancy” described resilience in the classroom, focusing on handling academic setbacks. The authors proposed that everyday resilience could enhance students’ capacities to handle academic challenges and improve overall well-being for current learning, future work performance, and life. This study reported on the effectiveness of implementing and evaluating a resilience program. The four goals were: (1) raising awareness of personal stressors and responses; (2) increasing self-efficacy by recognizing personal strengths and past successes; (3) teaching resilience-based strategies (cognitive restructuring, mindfulness, controlled breathing) to reduce anxiety and negative responses to clinical stressors; and (4) evaluating the impact of these strategies on students’ self-perceptions of their learning experience.

Drawing from previous research, the authors used a combination of approaches, including the five dimensions of resilience (confidence/self-efficacy, capacity to plan, sense of control over the learning environment and strategies, composure and lower anxiety levels, and commitment to study), cognitive behavior therapy (CBT), strength-based positive psychology, and performance psychology. These components were intended not to remove stressors but to equip students with coping skills to navigate personal, professional, and academic challenges, thereby enhancing their quality of life. The authors gathered six final-year physiotherapy undergraduate students from two universities who attended 90-minute weekly lectures for eight weeks delivered by appropriate practitioners. These lectures, timed to coincide with the start of clinical placements, were structured as group meetings and were audio recorded and transcribed. Between sessions 2–4, students returned to their clinics to trial specific resilience strategies and record the impact by responding to three questions: What happened during your clinical placement? What was stressful, and what positive coping strategy did you try? What did you think and feel? The authors aimed for participants to gain knowledge about resilience through concrete experiences, including trialing, evaluating, and reflecting on their actions. They posited that students’ perceptions and beliefs about the learning environment could influence their self-efficacy. By participating in

action research, students were able to monitor their beliefs, practice strategies, and positively change unhelpful responses.

The findings indicated that the program helped students address clinical learning stressors by understanding their triggers and responses and by planning and implementing targeted behavioral changes. The results affirmed the critical role of CEs in supporting students through personalized approaches, beyond merely altering curricula or the structural organization of learning. These approaches included helping students shift their perceptions and responses to clinical learning challenges, implementing effective relaxation techniques, and focusing on successes, strengths, and specific positive coping strategies.

Between the first and fourth action research sessions, students' descriptions evolved from viewing learning stressors as negative and extrinsic forces beyond their control to focusing on how they were intrinsically managing and planning for them. Encouraging students to focus more on the process of treating patients, rather than on their personal, emotional, or somatic responses, helped them rediscover their motivations and aspirations for studying as health professionals. This suggested that emphasizing building students' resilience could turn them into active, engaged learners rather than passive recipients of teacher-centered learning. The authors highlighted the importance of recognizing and developing students' abilities to cope with clinical learning challenges, rather than relying solely on external changes to the educational environment. This approach emphasized utilizing the inherent skills and capacities within the students themselves.

## **5. Conclusion**

The literature highlights the significant challenges faced by GS, particularly those in CSD programs, including stress, burnout, and mental health issues. To support these students, the development of resilience has emerged as a key strategy for mitigating these challenges and enhancing overall well-being and professional success.

## **6. Strategies for Building Resilience:**

- **Self-Care Practices:**
  - Encourage regular physical activity, mindful relaxation, and engagement in self-care activities (Bullock et al., 2017; Findley, 2024; Malandraki, 2022).
  - Prioritize sleep quality to buffer against burnout and improve mental health (Allen et al., 2021; Bullock et al., 2017; Coffman et al., 2019; Malandraki, 2022).
- **Supportive Relationships:**
  - Foster strong supportive relationships with peers, mentors, and faculty to create a nurturing academic environment (Beck et al., 2020; Bogardus et al., 2022; Bullock et al., 2017; Coffman et al., 2019; Findley, 2024; Lieberman et al., 2018; Malandraki, 2022).
  - Promote open communication to reduce isolation and stress. Flexibility with assignments, adjustments with coordination of assignments/tests, limiting syllabus changes, and reducing workload. Consider adopting a pass/fail grading system.

(Beck et al., 2020; Bullock et al., 2017; Ellis & Briley, 2018; Lieberman et al., 2018).

- Mindfulness Interventions:
  - Implement mindfulness activities such as meditation, breathing exercises, and cognitive restructuring to manage stress effectively (Beck et al., 2020; Bogardus et al., 2022; Delaney et al., 2015; Findley, 2024).
- Resilience Training:
  - Incorporate resilience-building strategies into the curriculum, such as weekly wellness check-ins, clinical wellness journal reflections, and peer-counseling sessions (Delaney et al., 2015; Malandraki, 2022).

Pursuing a resilience program similar to that of Delaney et al. (2015) but tailored specifically for CSD graduate students could further enhance these efforts. Such a program would involve structured resilience training integrated into clinical education, focusing on equipping students with the skills needed to navigate personal, professional, and academic challenges. To ensure the research's reliability and applicability, future studies should broaden the diversity of the student population by including participants from across the country and conducting larger randomized trials. This approach would provide a more comprehensive understanding of resilience in CSD programs and lead to more effective and widely applicable interventions.

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# STUDENT ABSTRACTS

# Suburban Diversification and Descriptive Representation

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**Abstract:** In an era characterized by rapid racial and ethnic diversification, I ask if political representation at the local level reflects this diversity. Do similarly diverse elected officials represent these diverse populations? That is, is there descriptive representation? I define diversification and representation in America and assess whether representation has kept pace with growing diversification. I review an extensive collection of scholarly work and ask why descriptive representation is important to minorities, democracy, and the country. The analysis spans a variety of contexts, including historical perspectives on descriptive representation and how it can lead to substantive representation, which reflects the needs and interests of the people being represented. I discuss communities' changing demographics, fairness and equality in political representation, trust in government, and government legitimacy. The scholarly literature suggests that while the country and, specifically, the suburbs continue diversifying, descriptive representation has lagged. Indeed, some scholars have found that many cities and municipalities intentionally fail to allow diversity of representation. I explore many tactics, policies, and laws that constrain minority representation at a local level. For instance, white fortressing, which is white people creating communities, often within existing communities, to exclude non-whites and rebounding, the systematic failure of cities to annex surrounding poor and minority communities. Finally, in my literature review, I explore the importance of descriptive representation and some consequences of the persistent overrepresentation of whites in increasingly diversified communities. This review is the first step in my thesis project: *Suburban Diversification and Descriptive Representation*.

# Translating Wellbeing Data for Local Hmong Youth into User-Friendly Report

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**Abstract:** After declining from 1999 to 2004 (females) and 2009 (males), rates of suicide in the U.S. for Asian American and Pacific Islander youth 10 to 19 years old have increased substantially (125% and 72%, respectively; Keum et al., 2024). The current study aimed to examine suicidal thoughts and behaviors and wellbeing experiences in Hmong youth in a rural, northwestern U.S. city. Accessing a small (N = 20), convenience sample of Hmong youth (mean age = 15.63), we explored aspects of well-being, experiences at school, connection with friends and family, physical activity, drug and alcohol exposure, knowledge about mental health, help seeking intentions, and suicidal thoughts and behaviors. Results indicated a relatively healthy sample with the majority (72.2%) reporting 3 or more days of at least 60 minutes of physical exercise, getting 7 to 8 hours of sleep per night (61.1%), never, rarely, or sometimes experiencing poor mental health (61.1%). Approximately one-third reported use of a substance adults would consider a drug (5.6% tobacco, 16.7% vape, and 33.3% alcohol). Interestingly, while no youth reported suicide ideation, half the sample reported a suicide plan. Statistically significant differences, in the expected direction, existed between youth who did and did not report a suicide plan. Briefly, t-Tests indicated youth with a suicide plan had lower mental health knowledge and feelings of belongingness and higher levels of distress. Descriptive statistics highlighted that our sample was relatively healthy-for example 72.2% reported 3 or more days of at least 60 minutes of physical exercise, 61.1% reported 7 to 8 hours of sleep per night, 66.6% reported that their mental health was not good never, rarely, or sometimes, and 33.3% reported use of a substance adults would consider a drug (5.6% tobacco, 16.7% vape, and 33.3% alcohol). Interesting statistically significant differences, in the expected direction, existed between youth who did and did not report a suicide plan. Briefly, t-Tests indicated youth with a suicide plan had lower health knowledge and behaviors (i.e., lower mental health literacy and help-seeking intentions) and lower feelings of belongingness (e.g., peer experiences, resilience, experiences with equity and diversity). Youth with a suicide plan demonstrated higher levels of distress (e.g., idioms of distress, academic stress, cultural sanctions, family conflict). This translational research (still in progress) aims to provide an accessible and actionable report to the leaders who work with these youth in the community.



# From Air to Leaf: Unraveling Aerobiota, Endophytes, and Leaf Litter Communities

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**Abstract:** Fungi are essential and abundant in the environment. Understanding community assembly processes of fungi will allow us to better understand community composition, which potentially influences environmental processes. In this study, we aim to investigate the fungal aerobiota community at the Big Chico Creek Ecological Reserve and compare it to fungal endophyte and leaf litter communities to offer insight into the processes that drive fungal community assembly and ultimately environmental processes. By utilizing two types of spore traps, we will collect and sequence fungal spores from both the air and rainwater from three sites at the Big Chico Creek Ecological Reserve. After obtaining all our samples, we will extract DNA and amplify the fungal ITS region to characterize fungal communities associated with the atmosphere, rainwater, foliar fungal endophytes, and leaf litter. Alpha and beta diversity will be assessed to determine what roles airborne fungi play in the community assembly of foliar endophytes and leaf litter communities. Understanding the roles that aeromycota play in the community assembly processes of foliar fungal endophytes and leaf litter communities can help us understand how varying communities will influence environmental processes.

# The Effect of Binge Eating Disorder in Adolescent Mice on Opioid Drug Response in Adult Mice

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**Abstract:** Binge eating disorder (BED) is when an individual is chronically overeating, or bingeing, as well as having a feeling of being out of control of their eating. BED is a common issue among adolescents, but despite the high prevalence of this disorder, there are few preclinical studies that explore the outcomes of the disorder. BED is similar to Substance Abuse Disorder (SUD) as both disorders are characterized by their binge episodes and involve similar neuronal pathways. Our laboratory has sought out to explore the relationship that BED has on SUD because of the similarities. Previous findings in our laboratory suggest that binge eating in adolescents potentiates cocaine reward and impulsivity in adult mice. To further explore the relationship between SUD and BED, this study will examine the effects of binge eating on response to opioids. Preliminary results show that the binge eating mice show more opioid reward. This suggests that morphine is more rewarding to mice who have developed binge eating disorder. Additionally, the binge eating condition shows greater withdrawal-induced symptoms, this suggests that adolescent binge eating increases morphine withdrawal. Additionally, analysis of neuronal activity demonstrates an increase in activity in the hypothalamus in binge eating mice. This suggests that binge eating leads to hyperactivity in the hypothalamus. Adolescent binge eating increases vulnerability to opioid addiction, as binge eating potentiates morphine reward and withdrawal. Understanding the risks associated with adolescent binge eating will allow for future studies on treatment and intervention strategies for BED.

# The Wobblies in California: 20th Century Labor Struggles

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**Abstract:** Employers and large corporations feel threatened when workers unite to leverage bargaining power for better wages and working conditions. Historically, the government both federally and at the local level has used its power to pass laws to prevent or impede unions, such as the right to protest. Examining the Industrial Workers of the World (IWW) in California during the early part of the 20th century will show how the history and struggle that unions encountered are still faced today. The free speech fights in Fresno and San Diego, the Wheatland Hop Riot, and the 1917 bombing of the governor's mansion in Sacramento are examples of past struggles that the IWW faced. These past events should not be forgotten in America's labor history.

# Impacts of Invasive Species Removal on Soil Health and Species Composition

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**Abstract:** Himalayan Blackberry (*Rubus armeniacus*) is recognized as an invasive plant species in California, often dominating the landscape in which it resides. Despite removal efforts, this species often exhibits regrowth after vegetation management is implemented. Lower Bidwell Park in Chico, California, has experienced a vast accumulation of *R. armeniacus*, and removal strategies generally involve hand removal in addition to grazing by goats. More recently, restorative measures have been performed, and native plant species have been planted after removal. However, it is unclear how the disturbance of these management strategies could impact key metrics of soil health, such as soil carbon and nitrogen content. In this study, a paired plot method was used to investigate how disturbance from invasive species removal impacts soil health. A total of 30 soil samples were collected from three different sites with varying time since invasive species removal. These samples were dried and processed for determination of carbon and nitrogen content via an elemental analyzer. Once the samples are run through the analyzer, we will be able to determine how time since invasive species removal impacts soil health across Lower Bidwell Park. Additionally, a species composition analysis will be conducted within these sites. Relative cover of each species present within a 1 m × 1 m frame will be recorded within the same areas where the soil samples had been taken. Additionally, we will measure a variety of plant traits on those same species (e.g., plant height, leaf area, pubescence). From these data, we will calculate species richness, evenness, Shannon diversity index, as well as the functional diversity within these communities. Assessment of functional diversity can reveal the significance of functional traits at the community level within each site. The mean and variation of the above-mentioned traits will allow us to determine how these traits may contribute to ecosystem functioning. We hypothesize that we'll observe no significant difference in soil health between these sites and a possible increase in species richness of native plants in treated areas. If the data support this hypothesis, land managers can continue with this management strategy knowing they are not negatively influencing soil health.

**Keywords:** *invasive species, disturbance, soil health, species composition, functional diversity*

# Using an Internet of Things System Design to Develop Problem-solving and Critical Thinking Skills in Underrepresented Minorities in Engineering

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**Abstract:** At Chico State, less than 10% of the engineering students in the EECE department (Electrical, Electronics, and Computer Engineering) are women, with an even lower percentage of women from underrepresented minority groups. These students face various challenges when participating in the field, such as the lack of leadership opportunities, gender bias, and stereotyping during team or group projects. All engineering programs require students to enroll in capstone classes, where they can apply their knowledge and technical skills to practice the design process. However, these courses only ensure that some students get practice with every aspect of the design process by delegating tasks to group individuals. This approach may make it difficult for female students to participate equally in the design process and they may be overshadowed by their male peers. Typically, project groups have at most one female student with many male peers.

This research project took a unique approach by empowering students from underrepresented minority groups. Over ten weeks, these students actively participated in proposing, planning, designing, and executing an Internet of Things (IoT) project. They were involved in all aspects of the project planning process, from identifying the problem statement and designing the goal to implementing the solution using a combination of hardware and software. By the end of the ten weeks, these students had developed and implemented a practical and impactful innovative door-locking system. The system, which utilized several digital and electronic components, allowed the user to connect to the door and remotely open and close the lock, demonstrating the project's tangible results.

The research evaluation used a qualitative assessment tool. Participants were asked to evaluate the study outcomes by responding to various prompts reflecting on their research experience. The feedback from the students highlighted their growth in areas not typically encountered within the engineering community. They developed critical thinking, problem-solving, and self-confidence, and gained experience in project leadership. This involved creative and strategic decision-making, timeline and deadline planning, seeking expertise when necessary, and troubleshooting hardware and software issues.

**Keywords:** *Internet of Things (IoT), Problem-solving Skills, Critical Thinking.*

## Qualitative Examination of Factors Associated with Attitudes and Behaviors Regarding Ethnic Foods Among College Students

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**Abstract:** The current study examined attitudes and behaviors regarding ethnic foods among university students. Fifteen college students from diverse cultural backgrounds participated in this study, and semi-structured qualitative interviews were conducted with the participants. Data were analyzed using QDA Minor Lite. Six themes that emerged from data analysis included family food tradition, shared connections through food, sensory perceptions and experiences, parental support, curiosity about cooking new foods, and health and food safety concerns. Family traditions and shared connections were salient to many of the participants. Family food traditions were the basis of participants' introduction to foods. Shared connections with other people, regardless of their ages, helped participants feel at ease when unfamiliar foods were introduced to them. Participants noted that shared human relationships directly influenced participants' perceptions and associations with foods within their identified ethnicity, as well as foods outside of their ethnic group. They reported being more willing to try unfamiliar ethnic foods while socializing within close interpersonal connections. Participants identified parents playing a crucial role in their experience with new food. Participants also noted that sensory perceptions were factors directly associated with their first experience of the food. Some of them reported enjoying cooking new foods and incorporating ethnic foods into their diet. When asked what healthy or clean foods meant to participants, they demonstrated high disregard for the synonymous use of clean and healthy. Instead, they had the belief that clean foods were associated with food safety and sanitation, and concerns surrounding food safety in the U.S. and foreign countries were apparent. The consensus regarding the nutrition content of foreign food was high in contrast with the dissatisfaction of American food and should be addressed in future research. Increasing variety in people's diets may improve their satisfaction with food-related life and well-being. Public health efforts that teach people the necessary cooking skills may strengthen their interest in diversifying their connections through a shared understanding of others' cultures.

# AI Impaction on the Video Game Industry

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**Abstract:** The purpose of this study was to explore the growing role that artificial intelligence is playing in the video game industry through content analysis. Artificial intelligence encompasses technologies such as computers, machines capable of simulating human intelligence and problem solving. This type of technology is surrounded by our daily lives such as computers, cars, phones and homes. The main research question driven by this study was, “How will the increased presence of artificial intelligence influence the video game industry?” As a student pursuing a video game development degree, my initial prediction was that artificial intelligence was very limited and had not yet infiltrated the industry just yet. Three key themes emerged: the impacts of job dynamics, legal and ethical challenges, technological advancements and industry adoption. In a world where layoffs are becoming more apparent, around the world there are great signs of anxiety over job security as AI is advancing. While AI is beginning to positively help reduce time strains on many of the tasks human workers are doing, this creates more concern for employment. However, AI can also lead to job reconfiguration or new opportunities within the game industry even if fear of job loss is in the air. Ultimately, the big question when it comes to AI is, “Is it ethical and is it legal?” Legal and ethical questions surrounding AI in video games are complex and critical. Issues such as the ownership of AI-generated content, the transparency of AI decision-making, and the use of real-life data to create immersive game environments raise significant concerns about the potential misuse of technology and intellectual property rights. Furthermore, ethical debates about AI’s role in game development revolve around fairness, bias, and the responsibility of developers to ensure that AI is used appropriately. Technological advancements in AI have sparked rapid adoption across the industry. AI is revolutionizing the way games are designed, from generating photorealistic environments to creating dynamic, intelligent characters that respond to players in real time. This level of sophistication promises to elevate the gaming experience but also pushes the boundaries of current development practices. As more companies adopt AI-driven tools, the industry is poised for a new era of innovation.

# Implementation of the Campus Opioid Safety Act at California State University, Chico

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**Abstract:** According to the California Overdose Dashboard, in 2022, Butte County recorded 69 opioid-related deaths, 101 opioid-related emergency room visits, and 71 hospitalizations related to opioid overdose. California Senate Bill (SB) 367, known as the Campus Opioid Safety Act (COSA), of 2023, aims to reduce opioid-related overdoses and deaths on public colleges and universities. COSA is a harm reduction (HR) measure providing life-saving education and mandates the distribution of federally approved opioid overdose reversal medication naloxone on campuses (Campus Opioid Safety Act, n.d.). In January 2024, Assembly Bill (AB) 461 expanded the COSA HR program by mandating the availability of fentanyl test strips to students and have since been included in overdose prevention kits. Within the framework of HR, it is acknowledged that drug use is a multi-faceted reality. It is a social issue that impacts all community members at some point in their lives. The goal of HR programs is to minimize associated risks by offering resources and support that promote safer use; the sharing of information and safer strategies with others who use drugs empowers a sense of agency which may provide other protective factors (National Harm Reduction Coalition, 2019). This exploratory research project aimed at evaluating the status and implementation of the COSA at California State University, Chico. We measured whether criteria set forth in SB 367 and AB 461 are being met by gathering qualitative data through one-on-one interviews with community-based and campus affiliated stakeholders. In addition, we reviewed pertinent literature and analyzed how well Chico State is meeting the goals of COSA. We concluded that our campus is sufficiently meeting program requirements. Wildcat Prevention, along with other campus stakeholders, including students, faculty, and other campus departments, continue to create new opportunities to increase student awareness and participation, reduce stigma and remove barriers to access of naloxone and fentanyl test strips. We recommend adding opioid overdose prevention education and training to the required online drug and alcohol courses, increasing locations of flyers related to overdose prevention kit availability and offered education and training events, and utilizing student email to increase awareness.

**Keywords:** *Campus Opioid Safety Act, harm reduction, naloxone, overdose, opioids, fentanyl, college*



# The Effects of Two Types of WM Load on Distractor Suppression

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**Abstract:** Studies have shown that working memory load (WML) influences attentional selection. That is, when many items are retained in working memory (WM), the target is more efficiently attended due to more efficient filtering of distractors. However, previous research has focused on the quantitative perspective of WML (i.e., the number of items) and rarely examined the qualitative perspective of WML (i.e., the precision of item). Furthermore, most previous research rarely manipulates the type of distractor suppression. The present study aims to investigate how quantitative and qualitative WML determines how efficiently an individual can suppress distractors, and whether the types of distractors determine the influence of WML on distractor suppression. In the first experiment, participants completed one of the two online experiments through Testable which were conducted using a dual task paradigm with a color working memory display and visual search task to assess the quantitative and qualitative perspective of working memory load and distractor types. The results of our 2 (low- and high-WM load) x 2 (multiple-item distraction, color-similarity distraction) x 2 (Quant WM group and Qual WM group) repeated ANOVA showed that a high-WM load reduces distraction compared to low-WM load. As well as quantitative WM is not affected by the distraction type compared to the qualitative WM. To replicate the results and produce a clearer result, we plan to conduct Experiment 2. In this revised experiment, we employ a similar memory-search dual task paradigm, but present two types of working memory load (WML) randomly on a trial-by-trial basis and simplify the load manipulation to a single variant. These experiments will provide compelling evidence supporting the close relationship between working memory and attention and further suggest the underlying mechanisms of quantitative and qualitative cognitive processes in working memory and attention.

## Predicting Binding Modes for Carene Synthase - Using Alpha Fold and Rosetta Software to Probe Product Promiscuity

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**Abstract:** Terpenes are a class of molecules made by plants and some bacteria, they are very abundant and are responsible for many of the forest or soil smells we experience. Terpenes have played a crucial role in the flavor and fragrance industry, so manufacturing terpenes are economically relevant. Terpenes are made in plant and bacteria cells via terpene synthase enzymes, and many of these enzymes are currently being studied. Computational chemistry as an approach yields certain tools which could assist in understanding the mechanisms of these enzymes. “Molecular docking” is a technique used to predict interactions between the enzyme and the molecule. Evaluating these predictions can provide insights into lab experiments. For our study we focused on Carene synthase (CarS), an enzyme from Sitka spruce. This is a monoterpene synthase enzyme (a subtype of terpene synthase) that produces carene, as well as the side products sabinene and terpinolene. The aim of our study was to correlate binding orientations to products made by carene synthase. We were able to adapt the techniques from a 2019 study by Dr. Dean J. Tantillo and Dr. Justin B. Siegal, “Predicting Productive Binding Modes for Substrates and Carbocation Intermediates in Terpene Synthases - Bornyl Diphosphate Synthase as a Representative Case.” We used Rosetta Commons software to dock two of the reaction intermediates and final products to find a location of convergence in the active site. We were able to find convergence for linalyl cation, terpinyl cation and carene which suggested tyrosine 544 likely plays an important role in the reaction. Our plans are to mutate this residue into a phenylalanine which would remove the hydroxyl group at this location while keeping the pi electron system. This is expected to alter the ability of CarS to produce carene and may lead to a preference for other monoterpene products. This will be tested with enzymatic assays of the CarS Y544F mutant. Future work is focused on finding convergence in our docking results on the other two main products (sabinene and terpinolene) made by carene synthase to gain additional insight into the active site and its impact on the product profile.

# Studies, Strategies, and Recommendations Regarding Speech-Language-Pathology Service Delivery for Children Raised in Multilingual/Multicultural Households

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**Abstract:** The goal of this literature review was to explore the best practices related to serving linguistically and culturally diverse children who need speech therapy. Linguistically diverse families struggle to find speech-language pathologists (SLPs) who can serve their children in their native language. That is due to most SLPs being monolingual in the U.S.'s dominant language—English. This lack of diversity is further apparent in the current research that focuses primarily on monolingual interventions and data collection from English-speaking children. The research for the best practices for diverse populations is currently ongoing and growing as the field slowly acquires more diverse SLPs. One of the findings of this review indicates that language discordance in speech-language and hearing services can negatively impact how a professional communicates the importance of their recommendations. The language discordance can further affect the rapport and potential for relationship building between the clinician and the family. Speech-language and hearing professionals can still adopt strategies to work with these families, even if they do not speak the same language. Strategies include ethnographic interviewing to help develop culturally-appropriate practices and goals, educating families about the additive view of bilingualism to honor language and cultural identity, and learning about bilingual development. Additionally, this review attempted to find interventions for the bilingual population. While appropriate interventions are not necessarily prominent, the research about the topic is necessary to eventually develop these interventions. Research summarized includes the effectiveness of bilingual intervention for children with primary language disorder, recast therapy to improve complex syntax in bilingual children, and how bilingual language input affects the language learning of bilingual children. The recommendations in light of this review are focused on recruiting a more diverse SLP population while equipping them with the tools necessary to conduct research in the future.

# Memory, History, and Healing: The Maidu Trail of Tears

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**Abstract:** This paper analyzes the forced migration of many tribes during the mid-19th century, focusing on the collapse of the “Nome Lackee” Reservation and its impact on Indigenous peoples in Northern California. The research draws on archival documents to detail the harrowing mismanagement, violence, and neglect that preceded the failure of the reservation system and the displacement of hundreds of Native people. The paper connects these historical events to the contemporary Nome Cult Walk, an annual event that retraces the path from Chico to Round Valley. This walk commemorates the forced removals and honors the survival and resilience of the tribes. The research supports Dr. Jesse Dizard’s larger film project on the Nome Cult Walk, providing historical context and helping to frame the ongoing efforts of Indigenous communities to remember and heal from past injustices.

## DNA Optimization of Foliar Fungal Endophytes in *Quercus Lobata* (Valley Oak) Leaves

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**Abstract:** Foliar endophytic fungi (FEF) live within plant leaves without causing visible symptoms or signs of disease. These communities exhibit significant diversity, with potentially hundreds of different fungal species coexisting within a single host. While some fungi are known to play crucial roles in plant defense and adaptation to stressful environments, the functions of many others remain unknown. It is assumed that some fungi are involved in the decomposition of leaf litter once leaves have abscised. Understanding the community assembly processes involved in leaf colonization after abscission, including the influence of FEF on the colonization of decay fungi, is critical for a greater understanding of carbon cycling, as community composition is shaped by both stochastic and deterministic factors, such as priority effects. Focusing on fungal communities from green leaves through the decomposition process by investigating their roles in leaf litter decomposition and effects on the carbon cycle at Big Chico Creek Ecological Reserve (BCCER), this study contributes to a deeper understanding of ecosystem dynamics. The findings can reveal how FEF shape leaf litter communities, affect nutrient cycling, and influence carbon sequestration. By tracking changes in fungal communities over time, they provide insights into ecological succession and adaptation, expanding our understanding of microbial ecology and ecosystem function. This summer's project aimed to determine the optimal type of bead matrix and the amount of lysing buffer solution required to break down plant material and extract DNA from fungal endophytes in *Quercus lobata* leaves. Different types of lysing bead matrix (F, J, I) and varying amounts of lysing buffer solution were tested using a bead-beating machine. Extracted DNA samples were then amplified by polymerase chain reaction and visualized through gel electrophoresis. The results showed that using lysing bead matrix F with an initial 350µL of lysing solution F, followed by a 2-minute homogenization, and then increasing to 400µL with an additional 2-minutes of homogenization, led to optimal DNA amplification compared to other treatments. These findings provided valuable insights into methodologies for processing fungal DNA extractions, aiding in the study of fungal endophytes' roles in leaf litter decomposition and their influence on the carbon cycle.

**Keywords:** *foliar endophytic fungi, decomposition, leaves, molecular techniques*

## Florence Arquin: A Woman Lost in History

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**Abstract:** When reflecting on key advocates for Latin American studies and art within the U.S. educational system, a few illustrious figures are often immediately invoked: César Chávez, the celebrated civil rights activist; Judy Baca, a distinguished artist, activist and professor; and perhaps most iconic of all, Frida Kahlo, whose enduring influence permeates both cultural and academic discourse. These individuals are widely acknowledged for their transformative contributions to Latin American studies and art. However, one name that seldom receives recognition in this intellectual domain is Florence Arquin. Although she was not of Hispanic or Latinx descent, Florence Arquin was very much a pioneer for Latin American studies between the 1930s and 1960s, using her influence to bring important cultural works to middle-American high schools and colleges. Arquin worked tirelessly to dispel the reductive stereotypes of “cuteness” and “curiosity” that were often ascribed to Latin American cultural artifacts and instead was determined to elevate their academic and artistic merit. This passion for Latin American culture would eventually lead to her most noteworthy project—the Kodachrome Slide Project of Latin America—where she traveled across various Latin American countries capturing life and culture through her photography in hopes of using the project to boost the interest of Latin American studies. Born in New York in 1900 to Russian immigrant parents, Florence Arquin had followed in her family’s footsteps and originally studied medicine before leaving the discipline altogether after her brother died from a contagious illness he contracted by a patient. She turned her focus to art, and by 1933 started her schooling at the Art Institute of Chicago. This would lead to her becoming an art teacher at Libertyville High School, a local high school in a suburb of Chicago, while simultaneously holding the role of administrator for the Federal Arts Project from 1935 to 1940. During this period, she collaborated with the Art Institute of Chicago where she developed educational programs (for secondary school students) that focused on Latin American art and architecture. She consistently advocated for increased visual materials that highlighted the cultural contributions of various Latin American countries, constantly submitting proposals and requests to the board and administration. In the early 1940s, she traveled to Mexico to further her study of painting. Her time spent in Mexico would result in her first solo exhibition in Mexico City where she would become very close friends with Diego Rivera and Frida Kahlo and would later use her photography skills to document the artists’ daily life. Her photos of Kahlo are still among the most readily reproduced and can be found on the Google Arts & Culture platform. Shortly after her exhibition, Florence’s most noteworthy project would come to light—the Kodachrome Slide Project of Latin America. Between 1945 and 1951, Arquin traveled extensively through Brazil, Peru, Bolivia, Ecuador, and other various Latin American countries capturing photographs of the countries’ landscapes, architecture, and cultural expressions. From 1951 to 1955, she toured various parts of Mexico and the U.S. with the slide collection, showcasing her work. These projects were part of an effort to provide educational institutions with visual resources to support the study of Latin American culture and history. In 1961, she initiated a similar project, securing another grant to expand the

collection by documenting additional images from her travels to Latin America, Spain, Portugal, and various European countries. Altogether, these two projects resulted in a collection of over 13,000 color slides, and 25,000 slides altogether, offering a rich visual archive of the diverse cultures and geographies of Latin America and Europe. Before her death in 1974, Florence would use her time to promote her slide projects while also writing a biography on the formative years of Diego Rivera. The overall intention of this project was to shine a light on a figure in history whose work made large contributions to art history, visual arts, and Latin American studies but whose name is seldom mentioned when referring to any of the mentioned fields. Over the summer my time was spent combing through (virtual) archives uncovering documents on Florence Arquin's life that date from 1923 to 1985. The documents housed her most noteworthy works but also found various documents such as, but not limited to, biographical material, personal correspondences between her and her close friend Frida Kahlo, writings, teachings, project files, printed material, photographs, artwork and scrapbooks that were all filled with intimate details of what her day to day looked like between the 1930s and 1960s. Because her archival collection consists of 18,346 images (digitized documents) I was unable to explore the collection in its entirety. Once finished with the collection, I hope to have a better understanding as to why a young woman born to Russian immigrant parents was so persistent in bringing attention to Latin American studies and art during the early twentieth century.

# The Impact of Intentional Postmortem Chemical Alteration on Bone Fluorescence Under an Alternate Light Source

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**Abstract:** A forensic anthropologist's responsibilities may include both field recoveries and laboratory analyses. Alternate light sources (ALS) are often used to assist in field recoveries in contexts where remains are highly fragmented and spread across a wide area. This project examines the impact of intentional postmortem exposure to commercially available caustic chemicals on the successful application of an ultraviolet ALS. Bone fluorescence under ALS occurs due to three aromatic amino acids (tryptophan, phenylalanine, and tyrosine) present in small amounts in human collagen. Fluorescence results from the excitation of electrons in certain molecules capable of fluorescence, or fluorophores, by exposing these molecules to a specific wavelength of light, referred to as the excitation wavelength. As the electrons relax, fluorescence is emitted from the object being lit. This study uses an ALS with an excitation wavelength in the ultraviolet range (365 nm), which is supported by existing literature in the field as the best ultraviolet wavelength for visualizing bone. Eight porcine femora (procured from the University Farm Meats Lab) are sectioned into 14 pieces and exposed to one of five different treatments: concentrated and diluted acidic, concentrated and diluted basic, and water. The fifth treatment is used to account for the effects of submersion on fluorescence intensity. All samples are exposed to the ALS and photographed prior to submersion, and then again at varying intervals over the course of 30 days. Fluorescence intensity will be determined using the ImageJ software to calculate a grayscale intensity value. These intensity values will be compared across treatments and bone sample composition (cortical or trabecular) to quantify the effects of chemical alteration on the success of ALS applications. I anticipate that a greater rate of fluorescence intensity loss will be observed in the more concentrated treatments, as well as with the trabecular samples. The results of this research project will fill a gap that currently exists in forensic anthropological literature, as ALS has been examined with other postmortem alterations like burning, but not chemical alteration. Additionally, this project could provide support for the continued use of nonhuman analogues like pigs in current and future research.

**Keywords:** *forensic anthropology, fluorescence, ultraviolet alternate light source, postmortem chemical alteration*



# Community Action and Empowerment Using Community Based Participatory Research to Create CBPR Methodology Curriculum and Pilot Course

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**Abstract:** A missing component in traditional research methodologies is that populations studied are left without an explanation of what the research will do, who it will help, and what actions may result. This is especially true when researching unhoused populations. Access to electronic communication may be out of reach, the ability to understand complex terminologies is often not present, and everyday challenges make routine tasks impossible. This project creates a curriculum for a Community-Based Participatory Research (CBPR) Methods course for Chico State graduate students and the local unhoused population. CBPR empowers the studied population by partnering with them as community researchers who engage in all levels of the project (Campbell et al. 2021). This partnership creates connections between the academic community and community researchers and gives co-ownership over the research. It also enables researchers to uncover variables that would have remained unknown without direct partnership. The most important aspect of a CBPR project is disseminating the findings through an action plan. Community researchers bring the results to the community in creative and accessible ways. Over six weeks, graduate students met with community researchers, developing relationships using icebreaking activities. The research found variables graduate students could not have envisioned before the community researcher's involvement (Montague 2023). The CBPR research methods course launches in spring 2024 at California State University, Chico. The goal is to empower the local community to create a plan of action to disseminate the findings to the community and leaders.

# Effects of Sociophonetic Variability on L1 Spoken Word Recognition

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**Abstract:** Acoustic variability refers to variations in speech that do not alter linguistic content. Previous studies have demonstrated that acoustic variability decreases first language (L1) spoken word recognition when varying talker, speaking style, or speaking rate but not amplitude or fundamental frequency. This ongoing study examines the effects of region-based sociophonetic variability. In Experiment 1, German speakers will attempt to recognize German nouns while listening to the words with low sociophonetic variability (six speakers of one regional variety, one repetition per speaker) and high sociophonetic variability (six speakers of each of six different regional varieties, one repetition per speaker). Participants will complete word recognition posttests. Experiment 2 will replicate Experiment 1 while counterbalancing the lexical difficulty of the word groups and learning conditions. Based on previous acoustic variability studies conducted in the L1, results of both experiments are expected to reveal decreased recognition for high variability over low sociophonetic variability, which would suggest that regionally varied exemplars of words lead to increased costs to speech processing. This would indicate that different sources of spoken variability that affect phonetically relevant properties of the speech signal, therefore, degrade spoken word recognition. The results of this study will have important implications for determining the nature and development of lexical representations.

# The Effects of Fuel Load Management on Soil Health

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**Abstract:** Oak woodlands, defined by their distinctive grassland valleys and oak canopies, are critical in supporting biodiversity, maintaining soil health, and promoting ecological stability. However, these landscapes face growing threats from wildfires, drought, conifer encroachment, and land development. These landscape changes have drastically altered fire regimes and increased fuel loads, leading to catastrophic wildfires. Effective management is essential to mitigate fire risks while preserving soil health, a vital component in water retention, nutrient cycling, and overall ecosystem resilience. This research investigates the effects of different fuel reduction methods, including mechanical thinning, prescribed fire, and natural wildfire, on soil health within oak woodland ecosystems. A randomized sampling design, stratified by treatment type and fire history, was used across multiple sites to evaluate the impacts of these fuel reduction methods. Soil samples were analyzed to measure properties such as soil fertility, water infiltration, bulk density, nutrient availability, and microbial activity before and after treatment applications. The study also examines the broader ecological effects, including changes in vegetation structure, biodiversity, and ecosystem recovery. The preliminary data showed that units treated with fire and mastication had higher grass and litter cover with reduced woody presence. In contrast, untreated units exhibited higher woody cover and litter accumulation. The unit impacted by the wildfire in 2020 displayed increased bare ground and higher hydraulic conductivity than other treatments. These initial findings show how different fuel reduction methods influence soil properties and vegetation structure. The study's findings will provide valuable insights into the long-term effects of different fuel reduction strategies on soil quality and ecosystem resilience. The research will help shape sustainable land management practices that enhance fire resilience while minimizing adverse effects on the oak woodland ecosystem. The results will equip land managers with the knowledge to make informed decisions that preserve the ecological balance of oak woodlands and ensure their long-term sustainability.

## Sugar, Fat, and the Implications of Glucolipotoxicity in Pancreatic Beta Cells

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**Abstract:** Type 2 diabetes is a problem that is ever increasing in the United States of America. According to the CDC, 1 in 10 Americans have this condition. Type 2 diabetes not only is prevalent in adults but has increasingly been found in children as time has gone on. One of the leading theories of causation for type 2 diabetes is glucolipotoxicity. Where due to overnutrition, specifically in fats and sugars in the form of fatty acids and glucose, causes cellular dysfunction within pancreatic beta cells. Pancreatic beta cells are the cells responsible for secreting insulin, initially the cell compensates by increasing its metabolism and increasing insulin expression and secretion. This allows the body to uptake glucose, however in type 2 diabetes the body becomes insensitive to insulin. As such the pancreatic beta cells increase the output of insulin, stressing the cell through the increased expression and workflow of creating and folding insulin through the endoplasmic reticulum (ER). Pancreatic beta cells also cannot forever increase their metabolism, eventually this collapses, due to glycolysis and fatty acid oxidation inhibiting each other while the cell attempts to do both. This creates metabolic stress resulting in radical oxygen species (ROS) being generated through rampant oxidative phosphorylation. Excess fatty acids existing within the cytoplasm can also react with compounds and proteins creating cascading effects leading to inhibiting crucial transcription factors, housekeeping proteins, destabilizing intracellular calcium levels, increasing ER stress, ROS production, and apoptosis. New treatments for type 2 diabetes are constantly being researched, recently lipid droplets have come into this scope of thought. These lipid droplets seem to have protective effects against lipotoxicity in pancreatic beta cells as they are to incorporate excess fatty acids within the cytoplasm into themselves by turning them into triglycerides. When looking into pancreatic sections of type 2 diabetic patients, lipid droplet quantities were lower as compared to healthy pancreatic sections. Showing these lipid droplets may have protective effects.

The aim of my project is to observe these effects within pancreatic beta cells under glucolipotoxicity. Over the course of this summer, I have analyzed the effect of glucolipotoxicity on a rat cancer pancreatic cell line (INS-1), showing that increasing levels of glucolipotoxicity and exposure causes greater cell death through an MTS assay. Utilized confocal microscopy to visualize intracellular lipids and lipid droplets within INS-1 cells exposed to varying degrees of glucolipotoxicity and solidified staining procedures. Designed primers for essential genes responsible for ROS production, ER stress indicators, crucial lipid droplet forming proteins, and markers for cellular health. Next steps for my project include analyzing gene expression over varying degrees of glucolipotoxicity, and immunostaining cells for confirmation of lipid droplet staining.

# The Need for Holistic Well-Being in Higher Education

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**Abstract:** This project was created to help support students through the many challenges they may face throughout college. College students are under incredible levels of stress. The American College Health Association (2017) found that 45.1% of college students reported experiencing higher than average levels of stress, and 12% reported tremendous amounts of stress. Similarly, 87% of students felt overwhelmed with responsibilities within the last year, and 84% felt mentally exhausted (American College Health Association, 2017). Outside of the United States, Robotham (2008) examined various studies regarding the levels of stress for college students and found that stress levels are increasing. The most common stressors rated by students as “traumatic or very difficult to handle” were academics (47.5%), finances (31.8%), intimate relationships (30.9%), and sleep problems (30%). College students face physical, social, and mental changes. College students consistently face difficulties due to academic pressure, adaptation to new environments, fear of failure, struggle to create uniqueness, inferiority, and attaining social familiarity (Yikealo, Yemane, & Karvinen, 2018). With increased levels of stress and anxiety, learning can be impaired. Stress and anxiety can hinder attentiveness, recall, and critical thinking, leading to poor academic performance, burnout, and even dropping out of college (Kitzrow, 2003). Neglecting student mental health needs is as costly for the university as it is for the students. Through a review of well-being initiatives and research across campuses, strategies which supported the whole student, including their roles outside of campus, were shown to have the greatest impact. Holistic well-being provides a framework for supporting individuals for all dimensions of their wellness. Utilizing holistic well-being, this project created six modules to help assist students with their mental wellness throughout their college careers. They are as follows:

Module 1: Well-Being Resources Currently Available at Chico State.

Module 2: The Need for Holistic Well-Being

Module 3: Coping Skills

Module 4: Eight Dimensions of Wellness

Module 5: Self-care Basics and Mindfulness

Module 6: Individual Self-Care Plan

After the modules, students are asked to complete a short assessment of five questions to identify successes, unmet needs, and continue to improve the curriculum.

# Exploring Imposter Syndrome among First-Generation Black, Indigenous, and People of Color Graduate Students in Hispanic-Serving Institutions within Predominantly White Academic Environments

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**Abstract:** First-generation Black, Indigenous, and People of Color (BIPOC) graduate students frequently encounter heightened levels of imposter syndrome, particularly while attending predominantly White academic institutions. Imposter syndrome may also impact a student's anxiety, lack of psychological well-being, stress levels, academic performance, and perfectionism (Bernard et al., 2020). Additionally, BIPOC graduate students face unique challenges such as limited resources, insufficient faculty representation, and cultural imposter syndrome, which can undermine their academic success and sense of belonging. There is limited research on first-generation BIPOC graduate students, particularly in examining their experiences with imposter syndrome and the impact on their mental health, academic performance, and personal stressors while attending predominantly White academic institutions. The purpose of this study is to explore the effects and impact imposter syndrome has on first-generation BIPOC graduate students who attend a Hispanic-Serving Institution within a predominantly White academic environment across the California State University system. A cross-sectional mixed-methods approach was utilized to collect data through purposive and snowball sampling methods, recruiting 100 participants to complete an online survey, which included an informed consent form, a demographic questionnaire, and a Likert scale survey. In addition, structured interviews were conducted with 10 participants who met the inclusion criteria. Participants were asked eight open-ended questions to understand their experiences with how imposter syndrome has impacted their academic performance, mental health, personal and emotional well-being, and overall sense of belonging within their graduate programs. While the results of this study are pending, it is essential to expand research on these students' experiences to inform the development of additional educational, behavioral, and community support systems. Findings from this research may contribute to creating resources that can help foster a sense of belonging, representation, and support for first-generation BIPOC graduate students in Hispanic-Serving Institutions within a predominantly White academic environment.

**Keywords:** *BIPOC, Hispanic-Serving Institutions, predominantly White academic environments*



# APPENDIX

## Appendix A

# Research & Writing Resource List

### Campus Writing & Research Resources

- [Writing Tips – Graduate Studies – Chico State](#)
- [Activities \(Thesis/Project Guidelines\) – Graduate Studies – Chico State](#)
- [Writing Center – Student Learning Center – Chico State](#)
- [Subject Librarians | Meriam Library | Chico State](#)
- [Research Subject Guides | Meriam Library | Chico State](#)
- [ESL Support Services – The Department of English – Chico State](#)
- [BSS Student Success Center – Behavioral & Social Sciences – Chico State](#)
- [Chico State University Communicators Guide](#)

### Campus Research Opportunities

- [Student-Faculty Research Collaborative](#)
- [Annual Student Research Symposium](#)
- [Student Awards for Research and Creativity \(SARC\)](#)
- [BSS Future Scholars Program](#)
- [Chico STEM Connections Collaborative \(CSC2\) Undergrad Research Program](#)
- [California Pre-Doctoral Scholars](#)
- [Chancellor's Doctoral Incentive Program \(CDIP\)](#)
- [Funding for Graduate Research and Conferences](#)
- [Graduate Equity Fellowship Program](#)

### Websites

- [Style and Grammar Guidelines \(Official APA website\)](#)
- [MLA Style Center \(Official MLA website\)](#)
- [The Online Writing Lab \(OWL\) at Purdue](#)
- [Graduate Writing Overview \(Purdue OWL\)](#)
- [How to Distinguish Between Popular and Scholarly Journals \(UC Santa Cruz\)](#)
- [Writing Tips & Tools \(University of North Carolina at Chapel Hill\)](#)
- [UW-Madison Writer's Handbook \(University of Wisconsin–Madison\)](#)
- [Handouts \(University of Illinois at Springfield\)](#)
- [Common Errors in English \(Washington State University\)](#)

### Books

- *The Artful Edit: On the Practice of Editing Yourself* by Susan Bell
- *The Elements of Academic Style: Writing for the Humanities* by Eric Hayot
- *Stylish Academic Writing* by Helen Sword