

University of California, Santa Cruz

***Report from the Graduate Student Cost
of Attendance and Living Calculator
Project***

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I. Introduction: Creating the Graduate Student Cost of Attendance and Living Calculator

Over the course of the Spring Quarter 2020, a team of faculty senate and graduate student researchers at UC Santa Cruz created a prototype for a Cost of Attendance and Living Calculator for graduate students [GCOAL Calculator]. The project was launched in response to a pressing need at UCSC and other UC campuses facing escalating housing costs: to establish affordability thresholds for graduate students, so as to better understand how much support they require in order to cover basic expenses while pursuing their degree. Outside the university such an affordability threshold is commonly known as a “living wage” or “cost of living” [COL]; within the university as “cost of attendance” [COA]. In this project we combine the two terms into “GCOAL” including data relating both to fluctuating local and university-specific costs. This prototype Calculator is now available for access at <http://www2.ucsc.edu/gradcosts>.

The aim of the project was to generate a user-friendly, regularly updated tool to estimate basic costs that are both specific to students in terminal advanced degree programs -- “graduate students” -- and to the costs and conditions in the cities and regions in which the ten University of California campuses are based. Such a calculator would have two main uses: 1) **personal budgeting** by prospective and incoming graduate students as they prepare for costs of a UC degree and 2) **informing determinations of appropriate levels of support** on the part of relevant campus administrators like the Graduate Division and Financial Aid Office; U.C.-wide officials and research staff like IRAPS and the UC Regents; and graduate student representatives like the Graduate Student Association and the Graduate Student Union [UAW]. Establishing COL and COA would aid in our analysis of the needs of graduate students in general and those with particular needs, including “non-traditional” graduate students, such as those with dependents, as well as first generation graduate students and those from historically marginalized groups.

The Graduate GCOAL Calculator builds on similar “living wage” calculators developed by economists and economic geographers in recent years, combining this approach with UC and campus-specific measures of cost of attendance for graduate students.¹ “Living wage” estimates move beyond outdated, limited federal poverty measures by itemizing and regionally-adjusting the actual costs of a “basket of goods” individuals and families need to become self-sufficient, attain economic security, and lead decent lives without falling into poverty.² A living wage would be

¹ Glasmeier, K. A., (2018). [Living Wage Calculator](#). Department of Urban Studies and Planning, Massachusetts Institute of Technology; Gould, E., Mokhiber, Z., & Bryant, K. (2018). [The Economic Policy Institute’s Family Budget Calculator Technical Documentation](#). Economic Policy Institute; Pearce, M. Diana. (2018). [The Self-Sufficiency Standard for California 2018: Methodology Report](#). Center for Women’s Welfare, University of Washington

² Anderson, A. and S. Kimberlin (2018) “[Better Poverty Measure Shows Economic Hardship Is More Widespread in Certain Parts of California](#)” *California Budget and Policy Center*; Pearce, D. (2012) “[Counting the Poor with Competing Poverty Measures](#)” *Self-Sufficiency Standard, University of Washington*

sufficient to enable people to purchase the contents of this basket: a fixed set of necessary consumer products and services valued and regionally-adjusted on an annual basis. This includes generic items like housing, transportation, and food, as well as items particular to household type, such as childcare, and takes into consideration income requirements before and after taxes.

Living wage calculators, then, are user-friendly tools that help individuals, communities, and employers determine a local “living wage rate,” i.e. a wage that allows residents to meet minimum standards of living in a given locality, over a given period of time, and for different types of families. They exclude expenses deemed “non-essential,” including for leisure, entertainment, and eating out of the house, as well as for investment. There are currently three leading models for such calculators, which can be customized for counties and metro areas in the United States: the MIT Living Wage Calculator, EPI Family Budget Calculator, and the Self Sufficiency Standard produced by the University of Washington, with each using slightly different methodologies and measures of basic needs.³

Currently, the leading body of data upon which the campus depends to understand the financial needs of and cost of attendance for the UC graduate student body is a survey conducted by the UC Office of the President: the Graduate Cost of Attendance Survey [GCOAS], conducted in 2017.⁴ The GCOAS was itself developed as an improvement on previous methods of understanding graduate students’ “basic needs security,” and as a response to growing consensus around the importance of addressing these needs.⁵ Results of this survey are now used by UC leadership to plan financial aid packages, as well as to evaluate graduate student stipends.

While aiming to be comprehensive in its measure of basic needs, GCOAS, as with all self-reported survey data on expenditures, is nonetheless a limited metric: revealing mainly what students spend rather than the actual average costs they face in the market. Basing estimates for financial needs on expenditure data is particularly problematic when data collection is limited to a population that faces severe budget constraints.⁶ For example, low income and poor people may be forced to delay or forego basic needs, and thus report low overall spending. This is especially true when the cost of basic needs skyrockets, as it has for housing in our region and nationally.⁷ Under these

³ Glasmeier 2018; Gould, Mokhiber and Bryant 2018; Pearce 2018

⁴ See: University of California Office of the President, Institutional Research and Academic Planning, “Graduate Cost of Attendance Survey,” 2017. <https://www.ucop.edu/institutional-research-academic-planning/services/survey-services/GCOAS.html#>

⁵ Office of the Vice President for Student Affairs Student Financial Support, “Findings from the Graduate and Professional Student Cost of Attendance Survey 2016-17” November 2017.

⁶ Pearce 2012

⁷ For example, in the zip codes around UC Santa Cruz, the Fair Market Rent levels have increased 20-23% *each year* from 2017 to 2019. The result is that Santa Cruz county is now the *least affordable* county in California when comparing median renter wages and median rents. see:

https://www.huduser.gov/portal/datasets/fmr/fmrs/FY2021_code/select_Geography.odn;
https://reports.nlihc.org/sites/default/files/oor/OOR_2019.pdf

conditions, people will respond in a predictable number of ways—cutting costs by living in substandard or overcrowded housing, absorbing the increase by sacrificing other basic needs, or going into unsustainable debt.⁸ Thus survey findings of expenditures from a low-income population will reflect (and obscure) these sacrifices, hard choices, and future debts, rather than clearly report what it actually costs to maintain a decent, sustainable quality of life.

A new era of living wage research helps to correct for this by measuring more accurately the actual costs of a wider range of necessary goods and services.⁹ They construct a “basket” of essential goods, including housing, healthcare, transportation, food, and childcare, and gather the best available data on the cost of these items in a given place and time, and according to different family types. Further, they help establish thresholds of “basic” or “minimum” needs, which all people should be able to afford, without going into debt, or going without what they need. This would be a modest, sustainable living wage.

How might we apply the lessons of living wage research to the calculation of graduate student cost of attendance?

Both COA and COL measures have been adapted for this project. On the one hand, COL calculations of the basket of goods have been expanded to take into consideration costs and constraints specific to students’ academic life and professionalization—from books and software, to the reality of a 9 vs 12 month wage. On the other hand, cost of attendance considerations have been adjusted to include thresholds or limits within which students can achieve economic security and a decent standard of living in our local region. For the sake of this project, we interpret these thresholds to be those that would allow students to pursue their higher degrees without having to incur significant debt, or be significantly hindered from pursuing their studies by the need to support themselves.

How can we create a calculator that allows us to estimate this combined living wage and cost of attendance?

We started with the goal of taking the comprehensive basket of goods used to measure COA in the GCOAS—with the basket allowing for customization by family size and including housing, transportation, food, healthcare, childcare, and emergency expenses, alongside professionalization costs specific to graduate school. Then, rather than filling the basket with limited survey data for each item, we used the best available cost data from peer-reviewed, place-specific, and regularly updated data sources—following the example of living wage calculators.

⁸ A detailed study of the housing crisis in Santa Cruz in 2016-18 found that 70% of the 1,734 renters surveyed were “rent burdened” - or spend more than 30% of their income on rent, while 41% of renters faced “extreme rent burden”, spending 50% of their income on housing. High rent burdens led to a high overcrowding level of 27% of all county renters, and half of respondents said they faced difficulty paying bills and/or buying essentials such as food or medicine. See: <https://noplacelikehome.ucsc.edu/en/the-survey/>

⁹ Glasmeier 2018; Pearce 2018

Doing this synthesis involved three phases of research. We first evaluated each of these leading calculators in terms of their methodologies and underlying data sources. For consistency and accuracy, we have relied primarily on the University of Washington’s Self Sufficiency Standard (SSS), established by Prof. Diane Pearce and the Center for Women’s Welfare. The SSS was created in 1996, first commissioned by the State of Iowa, as a “bare bones” budget to estimate the minimum income needed to meet essential costs of living. It is now calculated for 41 individual states. Among the calculators, it has the most comprehensive, state-specific methodologies and is widely used by both public and private entities such as federal, state and local governments and workforce councils, non-profit community organizations, and anti-poverty initiatives for policy analysis, in poverty and support research, and as a wage-setting benchmark.¹⁰

We then conducted nine focus groups with a total of 29 graduate students, recruiting for diversity—including international and domestic students, those who are parents, and those in different fields—to assess the usefulness of existing measures, making sure that the "basket of goods" was comprehensive in capturing all necessary graduate student expenditures. Based on this analysis, we selected our data sources and created a prototype for a cost of living and attendance calculator for graduate students at UC Santa Cruz.

Moving forward, we have **five recommendations for the Graduate GCOAL Calculator:**

1. **Use of the calculator for both budgeting and determining student support.** *Beginning in the coming academic year, we recommend that this tool be used in two ways.* First, prospective and incoming UCSC students should be encouraged to use the calculator to estimate their costs, including domestic and international students and those with and without dependents. In addition, we encourage its use by a range of stakeholders concerned, over the longer term, with determining support for graduate education and basic needs, including: administrators, graduate student groups, faculty and faculty senate committees, UC regents, and the California legislature.
2. **Ongoing development of the calculator by a standing committee.** *Over the coming two years, we recommend the calculator be updated and upgraded to incorporate additional functionality and customizability that exceeds the scope of this project.* In particular, department-based surveys should be developed to enable the addition of discipline specific professionalization costs. Regular updates can be overseen by a standing committee made up of representatives of a) Senate Committees, including the Graduate Council and the Committee on Planning & Budget, b) the Graduate Student Association, and c) Administrative units, including the Graduate Division and Financial Aid Office.

¹⁰ <http://www.selfsufficiencystandard.org/standard-in-practice>. For California-specific calculations and methodologies, see: <http://www.selfsufficiencystandard.org/California> and https://insightcced.org/wp-content/uploads/2018/04/CA2018_Methodology_StateReview.pdf

- 3. Improvement of institutional data on graduate students in general, and socio-economic conditions in particular, for use in conjunction with the calculator.** *After finding significant gaps and deficiencies in existing graduate student data gathered by GCOAS and other surveys, we recommend that IRAPS and all campus entities concerned with student success gather more of such data and do so more effectively.* This should include by a) improving survey design, data cleaning and validation, and calculation of summary statistics; b) greater data transparency, including access to survey distributions and explanation of underlying methods; and c) more regular administration for system-wide, longitudinal analysis. *In addition, we recommend UC campuses begin to systematically gather and analyze data on graduate students' socio-economic status [SES].* This should include by: a) adding SES questions to GCOAS and other surveys, including on first generation status, sources of income, debt incurred while pursuing degree, and number of dependents and b) aggregating SES data already gathered yet not included in the data warehouse, including if possible by Financial Aid and Slug Support. Such baseline data is essential for analyzing issues of equity for graduate students, for instance in correlation with data on race and gender. In addition, it will be necessary for correlating graduate incomes with the costs they bear, as provided by the Calculator, and thus for establishing affordability thresholds.
- 4. Enhancement of the pool of funds available for contingencies and to support non-traditional students.** We urge UCSC and the UC as a whole to recognize that students encountering significant unexpected expenses can be permanently derailed from finishing their degrees, at great cost to both the student and the University. In addition, typical levels of support can fall far short of that needed by “non-traditional” students, especially single parents, effectively ruling out the pursuit of a higher degree for such students. This risk of being impeded from pursuing or completing advanced courses of study disproportionately affects under-represented groups, who tend to have fewer alternative resources to fall back on. *We thus recommend enhancing the pool of funds available both to support non-traditional students and to help students meet unexpected expenses. The methodology for apportioning these funds, and for advertising their availability, should also be examined, with the welfare of under-represented students in the forefront of the discussion.*
- 5. Expansion of the calculator across the University of California.** *Over the longer term, we recommend the calculator be adopted by and adapted to the local conditions on our nine sister campuses in the UC system, enabling us to compare cost of living and attendance for graduate students system-wide. We imagine such a calculator could possibly even be expanded to other categories of workers, including staff and faculty, and thus help inform decision making around the cost of living for workers UC-wide.*

II. Background

In this section, we provide some background information on the graduate student population, and the nature of studies that attempt to characterize it, that is helpful for placing the calculations that follow in an appropriate context.

a. Graduate Student Profile: Increasingly Diverse and Economically Constrained

High costs of living in Santa Cruz, particularly due to the escalating cost of housing, has brought attention to the challenge of meeting basic needs for income-constrained graduate students. We know that these mounting challenges are impacting graduate students' educational outcomes as well as overall well-being, including their mental health.¹¹

Moreover, we know that socio-economic background plays an increasingly significant role under these circumstances, as wealthier families can subsidize their children's education—and rapidly rising rental payments—while poorer families cannot. Since family net worth correlates with race and ethnicity, this rising cost of living will likely have disparate impacts on students of color – both graduate and undergraduate. Meanwhile, these impacts can be even more challenging for graduate students, who have no access to PELL grants, are less likely to be dependents, and are more likely to have dependents of their own. Thus we hypothesize that COL and COA helps explain the persistent underrepresentation of low income graduate students and graduate students of color, particularly Black and Latinx graduate students.

The following table shows the percentage makeup of entering cohorts of Ph.D. and MFA students, in three-year blocks over the past decade, in terms of race, gender, and international vs domestic status on campus. Overall, student numbers increased in the early part of last decade, but recently have leveled off at about 270 new Ph.D. and MFA students per year. Meanwhile, percentages of non-white domestic students have remained relatively constant. The major driver of growth has clearly been international students, whose percentage of the overall graduate student population has almost doubled in less than a decade, from 16.6% to 31.6%. This may help explain the decline in white/Caucasian students, as their fraction in the domestic cohort dropped from 62.6% in 2011-2015 to 57.3% in 2018-2021, (though the latter is still close to their percentage of the population of the U.S. (60.4%), it far exceeds that of California (37%)), in line with general national trends.¹² Meanwhile, though the Black/African-American cohort increased somewhat (from 1.2% to 3.2% of the domestic cohort), it still lags far behind the 13% Black/African-American fraction in the general US population or even the 6% fraction in California. The same is true for Latinx students, who comprise 18% of the U.S. population and 39% of the California population, yet only 18.3

¹¹ The 2019 CGDTS reports “about 4 in 10 (43%) doctoral students had financial struggles slow down their progress, with 20% reporting that this slowed progress a lot.” (2)

¹² Lorelle L. Espinosa et al, “Race and Ethnicity in Higher Education: A Status Report.” American Council on Education, 2019;

percent of the UCSC domestic graduate student population. Similar rates of underrepresentation are found among Asian American in relation to the state population, and for Native American students in relation to both the national and state population.¹³

Table I: Total numbers, and gender and racial/domesticity percentage breakdown, of incoming UCSC Ph.D. and MFA classes, averaged over three consecutive cohorts to smooth statistical fluctuations. The 2020-2021 inputs are projections based on what was known about the incoming class as of late June 2020. Reliable race/domesticity data was not available for the 2009-2012 period.

	2009-2012	2012-2015	2015-2018	2018-2021
Total Ph.D. plus MFA Students	598	704	810	808
Gender				
Female	43.5	45.0	46.0	47.0
Male	56.5	54.5	50.0	49.3
Unknown	0.0	0.4	4.0	3.7
Race/Domesticity				
International	---	16.6	23.3	31.6
Hispanic or Latino	---	11.4	13.2	12.5
African American or Black	---	1.0	1.7	2.2
American Indian or Alaskan Native	---	0.3	0.0	0.0
Asian	---	7.8	6.4	6.7
White	---	52.2	43.1	39.2
Two or More	---	4.1	6.3	4.1
Unknown or Not Specified	---	6.8	5.9	3.7

Yet we lack any analysis of why all of this is the case, or the ability to trace these factors over time.¹⁴ How many 2020 graduate students are first generation, how many have dependents, how many how many are able—or not—to afford rent and basic expenses, and how much debt are they accruing while in graduate school? And how do these factors relate to completion rates, time to degree, academic success, and overall well-being?

Attempts to answer these questions led us on this committee to the realization that, unfortunately, there is dearth of data on graduate students in general, and graduate student SES in particular. Baseline data on graduate student SES or economic conditions is not gathered by IRAPS, whether at the campus or UC-wide level. Rather, these statistics focus on the demographics of student level,

¹³ [American Community Survey 2018](#)

¹⁴ IRAPS, “Completing Graduate Degrees On Time: Report based on the 2019 UCSC Graduate Student Survey” 2019.

discipline, race/ethnicity, gender, and LGBTQ status, uncorrelated with SES.¹⁵ Campus and UC-wide surveys, even those focused on basic needs, also haven't gathered such data directly.

This is in contrast to undergraduate students, on whom robust SES data is gathered annually. The Division of Student Success and its Student Success Equity Research Center, together with IRAPS, track Pell Grant and EOP data as well as first generation status and, for the majority who are dependents, the SES of their parents. Graduate students, however, are not eligible for Pell Grants or EOP. And while they fill out information on parents' educational attainment and other SES indicators on their applications (where it is used to determine nominations for fellowships), for Financial Aid, and when they seek Slug Support, this data is never aggregated in the campus data warehouse.

Thus, while baseline demographic data is collected on graduate students' race, gender, and age, the lack of SES data collection means we can only hypothesize students' ability to afford their education, and the equity issues associated with this. Meanwhile, what data does exist for graduate students is in the form of sporadic surveys, which, while valuable, have limitations of their own. In what follows we offer some thoughts on these surveys in terms of their strengths and deficiencies.

b. Existing Graduate Student Survey Data, and its Limitations

The main source of data used to understand the cost of attendance for graduate students across the University of California system, and on individual UC campuses, are a small number of self-report expenditure surveys. The most important and large scale of these is the Graduate Cost of Attendance Survey [GCOAS], conducted in 2017. As noted in the introduction to the GCOAS Report, conversations between the Office of the President and campus Graduate Divisions and Financial Aid Offices revealed that for many years campuses were using a wide range of methods for estimating costs associated with obtaining a graduate degree, making system-wide analysis impossible. "While one campus conducted a survey of student expenses each year, the other campuses rely on a decade-old state- conducted survey (2006-07 Student Expenses and Resources Survey, California Student Aid Commission), adjusted annually for inflation." Thus, in 2016, amidst growing concern across the system about the issue of "Basic Needs Security," the UC Student Association recommended that the Office of the President move forward in planning and implementing the GCOAS and UCOP agreed to administer the survey the following year. (2)

UCOP's 2016 "Graduate Student Well-Being Survey," with report produced in 2017, also revealed widespread lack of "financial confidence" for graduate students, and the belief that this was

¹⁵ The IRAPS student statistics page for UCSC includes a robust array of longitudinal data. Most of this however is specific to undergraduates, e.g. "new student characteristics" and "graduation/retention." What data there is for graduate students, under "enrolled student characteristics," is limited to race, gender, and age. See: <https://iraps.ucsc.edu/student-statistics/index.html>

impacting their time to degree as well as overall mental health and well-being.¹⁶ Similar findings were found in UCSC’s 2019 “Completing Graduate Degrees on Time Report,” based on the 2019 UCSC Graduate Student Survey [CGDTS].¹⁷

These surveys are potentially valuable in providing a snapshot of the types and levels of student expenses across a distribution. Yet, they are also quite limited tools, as our analysis revealed.

In the case of GCOAS, we found two main issues: 1) problems in the design and methodology of the survey, and 2) inherent limitations in surveying a small, income-constrained population. Both issues make it impossible to extract definitive COA estimates from these surveys.

In terms of survey design, we found lack of validating and cleaning of the data (e.g. including both weekly and monthly entries); the calculation of summary statistics without regard to subsamples (e.g. students with dependents vs the whole population); and use of “averages” of the distribution without reference to whether these were mean or median. Moreover, the methodology combined a heterogeneous mix of data from four different sources without clarifying why one source was being used over another, and the choice is not consistent across categories.¹⁸

In terms of inherent limitations of this type of survey, GCOAS depends on self-reported expenditures for a small and income-constrained population. Responses don’t account for the actual market costs of these items – whether these are gauged from larger scale surveys or commodity prices, only what this population is able to afford, or not. This obscures whether the “COA” reported would provide for a decent quality of life, or reflects sacrifices respondents were forced to make. For example, a graduate student might spend a relatively small portion of their income on housing, but do so by sharing a high-priced one-bedroom apartment with others, or live in a garage, and thus lack privacy or safe living conditions. In other words, the choices students make when faced with rising housing costs and fixed income can lead to an underestimate of the cost of what a reasonable person would deem adequate housing.

Across both GCOAS and other surveys of graduate students we find an additional problem: equity issues go unexplored. As noted above, no baseline SES data is gathered on graduate students,

¹⁶ University of California Office of the President, “Graduate Student Well-Being Survey Report.” May 2017 <https://www.ucop.edu/institutional-research-academic-planning/services/survey-services/GWB.html>

¹⁷ <https://iraps.ucsc.edu/surveys/survey-files/gss-expected-graduation-and-reasons-for-slowdown.pdf>

¹⁸ In some cases, normative minimum or likely expenditure in a category combines a number from the UC survey with a number from a calculator. This further mixes methodologies and sources. We did not see a clear and consistent approach across categories, and it almost feels like cherry picking. For some categories, it makes sense to report an average figure of some sort, or perhaps a figure from a slightly lower percentile of the distribution. There will be variation, but it is difficult to make too many distinctions. For example, there can actually be considerable variation in food costs determined by food habits (not eating meat or drinking alcohol, for example), but this is too fine grained, and the overall impact would be relatively small. But in a category such as transportation, it seems that using public transportation versus owning a car makes a big difference, and reporting some average figure is confusing. For example, what is being used now is some sort of average across the two modes, but the full cost of parking is thrown in. Essentially, this will be a bimodal distribution, and one should recognize that.

whether in terms of family background, current finances, the need to support dependents, or additional rent or debt burdens. Thus SES can't be correlated with demographics such as race, gender, or family composition. We might expect, for instance, given historically rooted racial wealth gaps, a diminished ability for parents of non-white students to subsidize their income, but we can't analyze this given lack of baseline SES data. In addition, it is increasingly common for graduate students, especially women, to have dependents, while having dependents is one of the largest factors determining SES in general, and for graduate students in particular.¹⁹ Yet even when captured, UC graduate student surveys such as GCOAS don't include students with children in the averages they calculate for students overall, let alone correlate this data with other demographics.

The challenges presented by limited survey methods in establishing true costs for graduate students, with its variation by location and family composition, can be addressed through the careful design of a cost of living and attendance calculator. In what follows, we briefly describe the use of these tools for individual and family budgeting for low income populations, and the three leading models being used currently.

c. Cost of living calculators, and their potential for graduate students

Researchers and policy makers have used market-based and geographically-specific data to calculate standard cost of living estimates for people across the country.²⁰ Three of the most commonly cited calculators are The Economic Policy Institute's *Family Budget Calculator (EPI)*²¹, Massachusetts Institute of Technology's *Living Wage Calculator (MIT)*²², and University of Washington's *Self-Sufficiency Standard (SSS)*²³. These calculators provide a measure of basic needs by arriving at a county-level, minimum income standard for different family compositions. The calculators follow a market-based approach to derive the expenditure costs for living a modest, yet adequate, life that allows for some degree of self-sufficiency - that is, not relying on loans and public assistance due to housing and food insecurity, and not foregoing any basic needs to make

¹⁹ GCOAS did find that 9% of all graduate students system wide have one or more children, and that 25% send money home to others. CGDTS found 15% of students with children. Neither did analysis of the SES background of or economic situation for these students. Nor did they analyze or interaction with other demographics like race, gender, and age. For studies on links between family composition and SES, in general and for graduate students, see: "The Parent Trap: The Economic Insecurity of Families with Young Children." Demos, 2016 <https://www.demos.org/research/parent-trap-economic-insecurity-families-young-children>; Mary Ann Mason, "Why So Few Doctoral Student Parents?" *Chronicle of Higher Education*, October 21, 2009. <https://www.chronicle.com/article/Why-So-Few-Doctoral-Student/48872>; UCOP, "Parenting students' experience and challenges at UC" January 2019. <https://www.ucop.edu/institutional-research-academic-planning/files/uc-parenting-students.pdf>

²⁰ These have followed and built upon the US Census, which has begun to revamp its poverty threshold calculations by introducing the Supplemental Poverty Measure [SPM]. The SPM adds a regionally-adjusted Cost of Living [COL] calculation to the standard national poverty measure, with housing costs the bulk of this COL. The calculators additionally take into account basic needs such as healthcare, childcare, transportation, and taxes. See: https://calbudgetcenter.org/wp-content/uploads/2019/08/CA_Budget_Center_Poverty_Explainer_2019.pdf

²¹ See Family Budget Calculator (EPI), <https://www.epi.org/resources/budget/>

²² See Living Wage Calculator (MIT), <https://livingwage.mit.edu/>

²³ See Self-Sufficiency Standard (SSS), <http://www.selfsufficiencystandard.org/>

ends meet. The monthly earnings estimates assume full time working adults and include expenditure costs (like transportation, grocery, and daily necessities) as associated with employment.

Even though their overall objectives are the same, there is variability between these calculators in terms of methodology and data sources. For example, the Economic Policy Institute²⁴ calculates *daily necessities* using estimates from the Consumer Expenditure Survey, while the Self-Sufficiency Standard²⁵ uses a percentage of total expenses to estimate this. Briefly, each calculator tries to use empirical information to construct a reasonable minimum cost of living. Since every category of expenditure has some variability, each calculator uses some method of picking a single number from a distribution, reflecting a normative standard.

Despite their differences, the strength of the calculators lies in the use of market-rates -- based on large scale surveys and commodity price indices— rather than self-reported survey data from a limited population. Yet more work needed to be done to explicate the assumptions and choices made in selecting the best numbers for each category and correlate these with qualitative data about the costs our graduate students face.

d. Focus groups with UCSC graduate students, and the gaps they reveal

In order to improve available data regarding graduate students' financial needs from existing sources, and ultimately produce our own calculator, we conducted a series of focus groups with subsets of the graduate student population. Our goal was to learn more about what students were actually spending money on, as well as foregoing, in order to afford to live in Santa Cruz while pursuing their degree. Thus we asked participants four general questions:

- (1) What do you spend money on?
- (2) Do you spend money on items or services that are specific to your graduate work?
- (3) Are there expenditures that you have to forego because you don't have enough income?
- (4) Are there expenses associated with graduate school that you didn't anticipate?

Our overarching goal was to use this focus group data to assess the utility and comprehensiveness of both existing calculators and the GCOAS. This method is akin to what in Psychology is commonly called “member checking,” i.e. interviews with participants in previous rounds of qualitative research to enhance its trustworthiness and credibility. Thus we turned to the same graduate student population captured by GCOAS to assess how well the “basket of goods” from this survey, and other COL calculators, reflected their experience. We did not intend this data to be included as self-reporting of actual costs in monetary terms, nor did we use it for this purpose.

²⁴ See Economic Policy Institute, <https://www.epi.org/publication/family-budget-calculator-documentation/>

²⁵ See Self-Sufficiency Standard, <http://selfsufficiencystandard.org/the-standard>

For three weeks in May 2020, we conducted nine focus groups (n = 29 total participants) with UCSC graduate students to ask them to generate a list of types of expenses they have. First, we spent one week recruiting focus group participants. We did this by sending out a call for people to sign up over email. Participants were first asked to fill out a brief questionnaire that prompted them to indicate their department and identify whether they were an international student or a student parent. It was important to include the latter two identifiers because we expect that these groups may have expenses that differ from domestic students or students without children. After completing the questionnaire, participants were directed to sign up for a focus group based on identifiers: academic division, international students, student parents, or open to any student.

The following is the full list of categories of expenditures identified by the focus group participants. Many of the general expenses described by participants aligned with the frameworks of existing calculators, as well as the GCOAS (e.g., housing, transportation, food). However, participants also described many expenses associated with graduate school that deviated from these frameworks (e.g. professionalization costs), as well as from the self-reported expenses included within GCOAS categories (e.g. housing). *These deviations revealing missing items or inaccurate expenses are emphasized in the list with italics.*

1. **Housing.** All participants indicated that they pay rent. Most participants indicated that they live off-campus, which is consistent with findings from the 2016-2017 GCOAS.²⁶ Due to the high cost of housing in Santa Cruz,²⁷ students detailed costs not captured by the GCOAS. *Many participants described regular moving costs (e.g., needing money for deposits, renting a truck), often as a result of escalating rents and needing to find more affordable lodgings. Notably, many graduate students also referenced housing conditions in discussions of sacrifices they make due to their income level, with several people saying that they would choose to live with fewer people or in safer, more stable or more sanitary conditions if they could afford it. This could signal that self-report data of housing costs underestimates the normative cost of housing in Santa Cruz.*
2. **Food.** Every participant also indicated that they spend money on food: groceries and prepared meals. While some participants said that they sacrificed eating healthy, and often more expensive, food, others said that they have to allocate more money to groceries in order to accommodate dietary needs. Participants also varied as to whether they spend money on prepared meals at cafes or restaurants: some indicated that they had to spend money on this because their schedule was too demanding to prepare all of their meals at home, while others said that they rarely eat at restaurants or cafes because they don't feel they can afford it. *Although some measures of food costs use the thrifty or low-cost market*

²⁶ See Findings from the Graduate and Professional Student Cost of Attendance Survey 2016-17, <https://www.ucop.edu/student-affairs/files/GCOAS%20Report%202017.pdf>

²⁷ See No Place Like Home project, <https://noplacelikehome.ucsc.edu/en/>

rates, the variability in how people spend money on food, as well as concerns about dietary and health needs, indicates that a higher estimate than in GCOAS would be more appropriate. Indeed, thrifty and low-cost market estimates often fall short of sociocultural²⁸ and nutritional²⁹ expectations.

3. **Daily Necessities** This category was less clearly defined or described by respondents in focus groups, though they did mention items such as household goods (soap, shampoo, household cleaners, rat traps) as well as pet care costs. There were no significant differences found between them and GCOAS, in terms of what they actually spend and how expenses were reported.
4. **Health.** Graduate students qualify for remitted health insurance if they work 25% FTE or greater, and nearly all receive this benefit, as is assumed by GCOAS. Nonetheless health costs were discussed in every focus group. *This is because despite insurance coverage, many graduate students have out-of-pocket costs for co-pays, prescriptions, and medical procedures, all of which appear unaccounted for by GCOAS. Some of the most common health costs mentioned were co-pays for regular therapy appointments and unexpected large dental care costs (e.g., a root canal).* The dental insurance coverage that comes standard with GSHIP (i.e., the standard graduate student health plan) has a maximum coverage limit of \$1,000 (including diagnostic and preventative services).³⁰ *Therefore, the standard dental coverage does not adequately cover expenses for students who need more than minimal dental care. Several participants described having to delay important dental procedures (e.g., tooth extraction or root canal) due to an inability to pay. Further, graduate student parents and those with partners indicated that they would have to pay out of pocket for health coverage for their partner and children. This was typically described as a substantial expense, that many participants didn't expect upon arriving to Santa Cruz.*
5. **Recreation:** Students across subgroups spoke about this as a significant category. Costs associated with this included standard forms of recreation already captured by GCOAS. *In addition, respondents mentioned things not included, such as streaming services, and mentioned generally sacrificing this category—including time with friends or family, exercise, travel—in order to cover other expenses.*

²⁸ Maillot, M. Darmon, N. & Drewnowski, A (2010). Are the lowest-cost healthful food plans culturally and socially acceptable? *Public Health Nutr*, 13, 1178-1185. DOI: 10.1017/S1368980009993028

²⁹ Stewart, H. & Blisard, N. (2006). The Thrifty Food Plan and low-income households in the United States: What food groups are being neglected? *Food Policy*, 31, 469-482. DOI: 10.1016/j.foodpol.2005.12.002

³⁰ See UCSC Health Center, <https://healthcenter.ucsc.edu/forms/hc-1040-uc-ship-dental-and-vision-plans-quick-ref-8-27-18.pdf>

6. **Transportation:** Consistent with findings from the GCOAS,³¹ many participants indicated that they drive their own car. The expenses associated with driving their own car included: gas, car payments, regular maintenance, registration, and insurance. *One transportation expense that deviates from estimates from existing calculators is the cost of a campus parking permit. The cost of a campus parking permit was consistently mentioned as an unexpected expense. Participants who did not own a car described the cost of owning a bicycle and regular or occasional costs of using rideshare services, like Uber.*
7. **Graduate Professionalization Costs:** Participants listed several expenses associated with their experience as a graduate student, the estimates of which are not included in existing calculators, and not specified by GCOAS. *The most common expenses included: fees, books, software purchases, hardware, conferences, organizational memberships, misc research/teaching costs. Participants described paying regular student fees (amounting to approximately \$300 per quarter) as well as milestone fees (e.g., qualifying fee). Many participants described paying fees as an unexpected cost.*
- **Books.** Although existing calculators and GCOAS include the cost of books in recreation estimates, academic books are likely not included. *Participants in different divisions described the expense of books differently. This varied by division, with those in engineering described an inconsistent need to purchase books (e.g., the occasional mathematics textbook), while those in humanities and social sciences described the expense as regular and substantial. Although some participants said they would use free digital copies of books to offset the general cost, others described the need for hardcopy books to prevent eye-damage from excessive screen exposure.*
 - **Software and Hardware Purchases.** Although the university provides free access to some software,³² *most participants described expenses associated with software purchases or subscriptions. Some of the software identified in the focus groups is accessible to students (e.g., Adobe or Microsoft Word), however either participants were not aware of institutional access or they required a more advanced version of the software. Many of the participants indicated they needed to purchase software in order to complete their research. One frequently mentioned type was qualitative data analysis software, to which the university does not currently provide institutional access. The average cost of popular data analytic software is approximately \$37.41³³ per month. Other types of software mentioned included*

³¹ See Findings from the Graduate and Professional Student Cost of Attendance Survey 2016-17, <https://www.ucop.edu/student-affairs/files/GCOAS%20Report%202017.pdf>

³² See Information Technology Services, <https://its.ucsc.edu/software/student-software.html>

³³ According to <https://medium.com/snapout/top-7-qualitative-data-analysis-tools-957aa0db6dfb>; The monthly costs for popular qualitative data analysis software: NVivo 11 = 58.33, Atlas.ti = 155.66, Dedoose = 12.95, MAXQDA = \$4.13, QDA Miner = \$0, Quirkos = \$25.83, Saturate = \$5.

Zotero, iCloud storage, and photo or video editing software. *Students across all disciplines, but especially engineering, mentioned the need to update hardware, including computers, storage devices, and tablets for research.*

- **Conferences and Professional Memberships.** *Many students, especially in social sciences and humanities, referenced the cost of attending conferences and paying professional membership dues. These were understood by participants as necessary for professional and career development. The costs associated with professional memberships and conference attendance are not standardized and can vary widely. Attending conferences includes several associated costs including registration, travel, lodging, food, and occasionally the cost of giving a presentation (e.g., printing a poster). Oftentimes it is more cost effective, or otherwise necessary, to pay membership dues for the organization that sponsors the conference. The university sometimes provides financial support for attending conferences, yet participants described that the support doesn't typically cover the total expense of the conference, and that graduate students must have enough money to pay for the conference upfront, with the hope of being reimbursed in the future. Several participants notes that they had accrued credit card interest as they wait for reimbursement, which is typically not included in the reimbursement amount.*
 - **Miscellaneous teaching and research costs.** *Participants listed a variety of expenses associated with teaching and research materials, including pens, notebooks, index cards, printing or printing materials, clipboards, participant payment, and travel for fieldwork.*
8. **Other Expenses:** *Participants described a variety of other costs that do not clearly fit within the framework used in existing calculators and were not directly related to professionalization. These expenses were sometimes specific to particular groups, like students from working class backgrounds. For example, some participants described that they would send money to non-dependent family members. Most students reported significant costs associated with visiting family, these costs seemed especially prohibitive for international students many of whom described fears that they would not be able to see their family during their time as a PhD student at UCSC. Many students indicated that they make regular payments on debts, including student debt.*

III. UC Santa Cruz Cost of Attendance & Living Calculator

a. Metadata

The research we conducted over Spring quarter underscored the pressing need to update our collective understanding of the graduate student population and their economic situation, recognizing the role of local COL and university COA in shaping this situation. This includes both

by recognizing commonality as well as the variability across key groups of students in terms of the expenses they face.

As we learned from focus group discussions, the nature and amount of attendance and living costs can differ for different groups of students, as well as shift over the course of pursuing their graduate degrees. This includes for “traditional” and “non-traditional” students, with the latter including those with dependent children, for whom most living costs will be greater. Meanwhile, when it comes to professionalization costs, there’s further variability across field and discipline. Students report differences in terms of mode of transportation, and whether or not they drive or depend on public transport. There is also cross-cutting variability based on those with funding packages that enable them to study and live in Santa Cruz for nine vs. twelve months, with the latter far more common for STEM vs. non-STEM students. International students also report different kinds of expenses, for instance the need to return home at certain intervals over the course of their degree. While this may be deemed a non-essential “marginal cost,” it may nonetheless be essential for international student well-being, potentially impacting their success in the program and time to degree—particularly when juggling plane tickets with high universal costs associated with housing transportation in Santa Cruz.

Thus, building on the example of cost of living calculators, we seek to create a tool that can account for this variability, even while allowing us to establish a default cost for a “traditional” or “standard” student. Such a tool enables us to understand and predict the costs all graduate students will face over the course of their degrees on a monthly and annual basis, both universally and given their circumstances in terms of family size, domestic vs international status, whether or not they have a car, and whether they are living in Santa Cruz for 9 months or year-round. Ultimately, this tool would also allow for variability by discipline.

For this calculator, we have sought to establish evidence-based categories of basic expenses -- the “basket of goods” -- that can capture our local cost of living alongside graduate student professionalization costs. This basket of goods looks quite similar to that of other calculators, and also reflects the basic categories captured in the GCOAS. Table II shows these baskets, including descriptions of the source data and methods used to calculate each category of good within the basket. Table III includes the actual calculations of costs, by item and according to family size.

Table II: Summary of items and methodology used to estimate costs for items in the Cost of Attendance and Living basket. *All estimates are adjusted for inflation to 2020 value when needed/available

Item	Description	Source Data and Methods*
Housing	Our baseline housing configuration is one bedroom in a two bedroom	We use the rental price at the 40th percentile for Santa Cruz county, as derived from the U.S. Department of Housing and Urban Development’s

	apartment. We also provide costs for one of three bedrooms and for independent living in a studio/efficiency	(HUD) Fair Market Rents, FY 2021 . The estimate is for gross rent, which includes cost of shelter and basic utilities like water and gas.
Food	The estimate includes the majority of meals prepared at home from scratch with occasional meals outside the home, which was the most common arrangement reported in focus groups and the GCOAS survey. Occasional meals and snacks out seem consistent with a “basic” graduate student lifestyle, which can include professional commitments that require long days outside of the home	For meals and snacks outside the home we use the median GCOAS result for UCSC students. For in-home sustenance we use the Low-Cost Food Plan of the United States Department of Agriculture, which is based on a basic and adequately nutritious diet that accounts for a total of twenty-six items, bought from the market, and used to prepare meals at home (broader categories are grains, vegetables, fruits, milk products, meats and beans, and other foods). The county specific cost for Santa Cruz is derived from the Self Sufficiency Standard calculator, which estimates low-cost food plan items from the Map the Meal Gap , 2015 data. We reduce this by 20% to account for calories derived for meals and snacks outside the home.
Daily Necessities	This is a catch-all category that includes items that do not fall into the other mentioned baskets but are essential for a modest yet adequate standard of living. These include: clothing and shoes, cleaning products and household items, personal hygiene items, and telephone service. It does not include recreation, entertainment, savings, or debt repayment.	The Self Sufficiency Standard draws on the Consumer Expenditure Survey (CES) and estimates costs at 10% of all other essential costs. It is adjusted for Santa Cruz County for 2020.
Health	Although premiums are covered by standard graduate support packages, students have significant additional out-of-pocket expenses, including co-pays, deductibles and expenses beyond payment limits	Here, we use the Self Sufficiency Standard , which draws on the national Medical Panel Survey , regionally adjusted for Santa Cruz County. However, that estimate includes premiums, which our graduate students don’t pay. Thus we subtract an amount that lies between the Bronze and Silver premiums for the local Kaiser Permanente network.
Transportation	We provide separate estimates of transportation costs for students both with and without a car.	For students with cars, we use values from the Self Sufficiency Standard , which draws on estimates from the National Association of Insurance Commissioners and the Consumer Expenditure

		<p>Survey, for the costs of owning and operating a car, which includes: insurance, fuel, maintenance, financing, licensing and registration. We have added the cost of a campus parking permit. For students without cars, we use estimates from the UCSC Office of Financial Aid.</p>
Recreation	Some amount of recreation is generally recognized to be important for health and well-being	We make direct use of the GCOAS survey data to estimate reasonable recreation costs, which includes subscriptions to online entertainment services such as Netflix or Amazon, a gym membership, and a small social budget.
Book, Fees and Supplies	This category is specific to University students' enrollment and direct educational costs.	We use annual estimates provided by the UCSC Office of Financial Aid . The majority of costs in this category are registration fees set by the campus.
Taxes	Taxes are a commonly overlooked cost of attendance and include federal and state income tax and FICA and Medicare payroll tax. Sales tax is incorporated in the specific costs of basket items and not included in this category	We use the state-specific tax calculator http://users.nber.org/~taxsim/taxsim27/ to estimate income and payroll taxes for any given income assumption.
Professionalization Costs	Examples of these include conference attendance, professional society dues and professional development workshops, not all of which are routinely covered by the student's department.	Our survey found these costs to be field-specific, in that graduate programs require different forms of professionalization, and provide more or less support for students to use for this purpose.. Breaking these costs down by division or program will require additional study.
Childcare	This is a significant cost borne by the subset of our students who are parents or guardians.	Our estimate is derived from the Self Sufficiency Standard and reflects child care center and family child care center rates for Santa Cruz county. The market cost for decent and equal access for child care is set at the 85th percentile, especially for California, according to the Family Support Act, 1988 and further reaffirmed by The Child Care and Development Block Grant (CCDBG) Act of 2014. Data is from California Department of Education's Regional Market Rate Survey of California Child Care Providers, 2016 .

b. Calculations of Graduate Cost of Attendance & Living

Based on the above methods, we have arrived at the following estimation of the basic items in our basket of goods. (Please also see Table III)

1. Housing: \$1,315 - \$1,993

- The price range for single adults is for one-third of a three-bedroom unit to a studio, set at the 40th percentile for Santa Cruz County, with one-half of a two-bedroom unit as the central quoted value. Two adults without children are assumed to be a family living in a one-bedroom unit. Children are expected to have their own independent bedroom. The cost for other family composition is a two-bedroom apartment in Santa Cruz County.
- The estimates are from the US Department of Housing and Urban Development's Fair Market Rents (HUD FMR) 2021 (based on a rent survey conducted June 2020, which found a 20% increase in rents relative to the previous year's survey).³⁴ The external calculators all use HUD FMR data, however, the calculators do not yet have an updated estimate for 2021.
- Includes cost of shelter (rent) and utilities like power and gas.
- *Overall range: One Third of Three Bedroom (\$1,315); Half of Two Bedroom (\$1,510); Studio (\$1,993); One Bedroom (\$2,292); Two Bedroom (\$3,021); Three Bedroom (\$3,947)*

2. Grocery + Snacks: \$470

- The Self Sufficiency Standard provides us a way to estimate precise county-specific costs for USDA's Low-cost Food plan by using generating a region-specific multiplier from [Map the Meal Gap](#) by Feeding America (2015 data). This multiplier is based on actual market costs of the 26 food items listed in the food cost plan
- For counties: set up Relative Price Index = every sale of UPC-coded food items in a county to one of the 26 food categories in the USDA Low Cost Food Plan.
- The cost to purchase a market basket of these 26 categories is then calculated for each county. A county index is calculated by comparing the county market basket price to the statewide average cost of food in California, resulting in an estimate of \$311 per month, or \$324 per month when adjusted for inflation.
- The calculators, in their purpose of accounting for market costs of basic needs, only estimate for all meals prepared at home. However, GCOAS and our focus group discussions have exemplified the necessity of graduate students to eat on campus due to work schedules. This is further exemplified by Consumer Expenditure Survey data showing that the average American family spends 44% of their food budget on outside meals (as cited in Self Sufficiency Standard).

³⁴ https://www.huduser.gov/portal/datasets/fmr/fmrs/FY2021_code/select_Geography.odn

- The median expenditure for meals and snacks outside the home for single students from the GCAOS survey, adjusted for inflation, is found to be \$211 per month.
- Assuming that these outside meals and snacks account for 20% of calories, adjusting the Low Cost Food Plan and then adding in outside meal and snacks yields a monthly estimate of $\$211 + 0.8 * \$324 = \$470$ per month when rounded to the nearest \$10.

3. Daily Necessities: \$270

- Estimate is from the Self Sufficiency Standard, which is region-specific.
- Includes items such as phone, internet, housekeeping, personal care and apparel. It explicitly does not include recreation.
- The value for Santa Cruz County from the Self Sufficiency Standard is \$269, or \$270 rounding to the nearest \$10.

4. Health: \$80

- The median single-student expenditure from GCOAS study was found to be \$40, which is likely low due to income-constrained delaying of recommendation medical treatments.
- Instead, we make use of the Self Sufficiency Standard out-of-pocket health care cost estimate for the graduate student demographic in Santa Cruz County, which includes premium costs, medical services, drugs and medical supplies, and is \$150 per month.
- Graduate students don't pay premiums for GSHIP, so these must be subtracted from the Self Sufficiency Standard estimate. The premium for the Kaiser Permanente Bronze plan in Santa Cruz County is \$74 per month. Subtracting this from the Self Sufficiency Standard and rounding to the nearest \$10 yields a monthly out-of-pocket estimate of \$80.

5. Transportation: \$380/\$110 with/without car

- If transportation is by car, the Self-Sufficiency Standard provides a figure of \$306 per month, considering all costs including insurance and amortization. Including the \$75 per month cost of a B-permit for parking \$75 per month, and rounding, this yields \$380 per month for students with a car.
- For students without a car, our financial aid office <https://financialaid.ucsc.edu/cost-to-attend/index.html> estimates transportation costs at \$1272 per year, or \$110 per month for students with no car.

6. Recreation: \$70

Taking the median value of the GCOAS survey data for single graduate students and inflating to the current year, yields \$70 per month. This estimate includes items such as a gym membership or subscriptions to online entertainment services (e.g., Amazon or Netflix).

7. Books, Fees, Supplies: \$200

The Financial Aid Office lists campus fees as \$1238 per year, and estimates the annual cost for books and educational supplies (a student-specific cost over and above that of standard personal supplies) to be \$1146 per year. Added together this is \$2384 per twelve-month year, or rounded to the nearest \$10, \$200 per month.

8. Taxes

A state-specific tax calculator, including estimators for both state and federal income tax (IT) and FICA and Medicare payroll taxes (PT) is provided by the National Bureau of Economic Research (<http://users.nber.org/~taxsim/taxsim27/>). This can be used to estimate taxes for any income and domestic situation (sales tax is assumed to be incorporated in the specific costs of basket items quoted above and is not included here). For single students, the marginal tax rates are fixed over the full range of relevant income. Thus, tax amounts can be simply encapsulated in linear formulae as follows

$$IT = \$2210 + 0.160*(Y - \$30,000)$$

$$PT = \$2205 + 0.077*(Y - \$30,000)$$

where **Y** is total taxable income. A student with an annual income of \$30,000 would thus pay approximately \$4415 in taxes, leaving an annual spendable income of about \$2130, which would not be enough to cover the basic costs of attendance for independent adults.

9. Emergency Savings: \$100

Graduate students and their families often face an economically precarious existence with little cushion for emergencies or unexpected expenses. This item is a way to arrive at the most universal of economic security needs after basic needs are met – savings for emergencies. The estimate is based on making up for earnings of one adult becoming unemployed over the average job loss period, less the amount expected to be received in unemployment benefits. For California, the median length of job tenure is five years, so savings is done for job loss over a course of five years. The estimate also assumes some accumulation on average savings account interest rate. *Note: For a two-adult household, it is assumed that the second adult continues to be employed. Hence, savings only need to cover half of the family's basic living expenses over the job loss period. In addition, graduate students do not generally have job security for an average tenure of five years. Meaning, our estimate is an underestimation for how much graduate students might need to have general economic security.

Table III: Summary of estimated costs per month for identified expenditure categories, for differing domestic configurations.

Notes: Taxes include federal and state income tax and FICA, and are calculated for a single student being compensated at the level needed to, after taxes, cover costs for one bedroom in a

two-bedroom apartment (\$1,510 per month). Housing costs are based on 2021 estimates from the US Department of Housing and Urban Development’s Fair Market Rents (HUD FMR), based on a rent survey conducted June 2020 that found a 20% increase in rents relative to the previous year’s survey. Car ownership is assumed except for the one adult, no child case. For that case, it may well be practical to rely on public transportation, and so two values are quoted: with and without car ownership. Also, it should be noted that in meeting Cost of Attendance requirements, total compensation could be reduced by providing a portion of compensation in a tax-free manner. A row for professionalization costs is added for a placeholder. These tend to be discipline-specific and require further evaluation.

Item	1 Adult, 0 Children	2 Adults, 0 Children	1 Adult, 1 Child	1 Adult, 2 Children	2 Adults, 1 Child	2 Adults, 2 Children
Housing	\$1,315/ \$1,510/ \$1,993	\$2,292	\$2,292	\$3,021	\$3,021	\$3,021
Food	\$470	\$893	\$843	\$1,175	\$1,245	\$1,560
Daily Necessities	\$270	\$366	\$464	\$562	\$526	\$621
Health	\$80	\$296	\$478	\$471	\$443	\$438
Recreation	\$70	\$105	\$105	\$140	\$140	\$175
Transportation	\$380/110	\$666/220	\$389/158	\$389/206	\$774/270	\$774/316
Books, Fees, & Supplies	\$200	\$200	\$200	\$200	\$200	\$200
Emergency Savings	\$100	\$77	\$343	\$470	\$116	\$201
Childcare	\$0	\$0	\$722	\$1,444	\$722	\$1,444
Taxes	\$690/600	\$950	\$1,265	\$2,270	\$1,460	\$1,850
Professionalization Costs	TBD	TBD	TBD	TBD	TBD	TBD
Total per month	\$3,215 - \$3,770*	\$5,196 - \$5,642**	\$6,870 - \$7,101**	\$9,959 - \$10,142 **	\$8,143 - \$8,647 **	\$9,826 - \$10,284 **

*Total range: $\frac{1}{3}$ of 3-bedroom apartment without car to $\frac{1}{2}$ of 2-bedroom apartment with car

**Total ranges: without car to with car

Additional costs to be self-reported or added later

We recognize from our focus group research certain “marginal costs” that it is likely large numbers of students bear, and that are important for student well-being, yet which would be impossible for us to calculate. This includes the need to travel home for international students, as well as to send money home to non-dependent family. For these costs we have created a box that individual students can fill in. This will be useful for individual budget estimates based on the calculator, but not necessary for larger-scale graduate student support.

In addition, one of students’ most common concerns related to unanticipated costs for “professionalization” related items -- from professional association membership and conference fees to the expense of software and hardware maintenance. Given the variation of these costs across fields and departments this exceeds the capacity for us to calculate for the current iteration of the calculator—beyond the estimate of financial aid plus campus fee we currently include under “books, fees, and supplies.” Rather, as we discuss in recommendations, we hope in future individual departments can conduct surveys assessing professionalization costs internal to their program. This data could be fed into this section of the calculator, with students given a drop-down menu by department to select. These costs, as in all others on the calculator, would be updated annually or semi-annually.

IV. Recommendations

We have the following recommendations moving forward with the Graduate GCOAL Calculator project:

1. Use of the calculator for both budgeting and determining student support

Overall, as graduate growth is occurring alongside escalating cost of living, as well as a contraction of the academic job market and increasing precarity due to the pandemic, it is incumbent on institutions of higher education like UCSC to gather data that enables us to recognize graduate students’ financial needs, so as to help them avoid increasing debt and improve educational outcomes. This is particularly true for students from historically marginalized groups, and groups already under-represented in graduate school.

To this larger end, we hope that this new tool will be helpful for graduate students and our campus in two main ways. First, the GCOAL Calculator can serve as a user-friendly budgeting tool for prospective and incoming UCSC graduate students who need to estimate

and prepare for their costs should they move here. This would help students who need to consider particular circumstances: domestic vs international students, students with and without dependents, and students with funding packages for nine vs 12 months. We imagine that it would also aid students in considering where to live, whether or not to drive a car, and how to balance basic living expenses with emergency savings.

Second, the calculator will be useful to a range of stakeholders concerned with, dedicated to, and deliberating about support for graduate education and basic needs. This includes administrators in Financial Aid, the Division of Student Success, departmental Graduate Program Directors, and IRAPS; graduate student groups like the GSA and UAW; faculty advisors, department chairs and graduate directors, and faculty senate committees like CPB and the Graduate Council, and higher level bodies like the UC Regents, and California legislature. This also includes for newly formed groups on campus, such as the Joint Senate-Administration Working Group on Graduate Education. The calculator can also help inform discussions in the public sphere on the adequacy of current graduate support levels, and the degree to which the university –locally or statewide— needs to be better supported to cover these costs.

2. **Ongoing development of the calculator by a standing committee.**

Over the coming two years, we hope the calculator can be updated to incorporate additional functionality and customizability that exceeds the scope of this quarter-long project. For instance, as we have seen, it will be important to add professionalization costs specific to given academic disciplines, which tend to vary considerably, e.g. for attending particular conferences or purchasing particular types of software. Gathering this data would be possible by having departments conduct their own analyses of anticipated student costs.

Regular updates can be overseen by a standing committee made up of representatives of a) Senate Committees, including the Graduate Council and the Committee on Planning & Budget, b) the Graduate Student Association, and c) Administrative units, including the Graduate Division and Financial Aid Office. This committee could also conduct expanded focus groups once the calculator is created, to assess its usefulness and impact.

3. **Improvement of institutional data on graduate students in general, and socio-economic conditions in particular, for use in conjunction with the calculator.**

In the coming two years, we recommend that IRAPS continue to develop its new Graduate Cost of Attendance Survey to help campuses better understand the socio-economic background and conditions of UC graduate students, their cost of attendance, and how all of these change over time.

After finding significant gaps and deficiencies in existing graduate student data gathered by GCOAS and other UC surveys, we recommend that IRAPS and all campus entities concerned with student success gather more of such data and do so more effectively. This development should include: a) improving survey design, data cleaning and validation, and calculation of summary statistics; b) greater data transparency, including access to survey distributions and explanation of underlying methods; and c) more regular administration for system-wide, longitudinal analysis.

In addition, we recommend UC campuses begin to systematically gather and analyze data on graduate students' socio-economic status [SES]. This should include first by adding SES questions to GCOAS and other surveys. Such questions would capture data on graduate students' first-generation status, much as undergraduate data does. It could find out more about graduate students sources of income— whether from within their programs (GSR-ships, TA-ships, fellowships) or external to them (e.g. outside jobs, family support etc). This can then be measured in relation to expenses so as to determine the amount of debt and rent burden students incur. Finally, given the great variability found across living wage calculations according to family composition—which affects every other basket in the calculator with the exception of professionalization costs— it would be very valuable to understand how many graduate students have dependents. Related to this, questions could find out about debt incurred while pursuing their degree, and the impact of this debt.

In addition, and if possible, we recommend aggregating SES data already gathered yet not included in the data warehouse, including if possible by Financial Aid and Slug Support. Such baseline data is essential for analyzing issues of equity for graduate students, for instance in correlation with data on race and gender. In addition, it will be necessary for correlating graduate incomes with the costs they bear, as provided by the Calculator, and thus for establishing affordability thresholds.

4. Enhancement of the pool of funds available for contingencies and to support non-traditional students.

We urge UCSC and the UC as a whole to recognize that students encountering significant unexpected expenses can be permanently derailed from finishing their degrees, at great cost to both the student and the University. In addition, typical levels of support can fall far short of that needed by “non-traditional” students, especially single parents, effectively ruling out the pursuit of a higher degree for such students. This risk of being impeded from pursuing or completing advanced courses of study disproportionately affects under-represented groups, who tend to have fewer alternative resources to fall back on. *We thus recommend enhancing the pool of funds available both to support non-traditional students and to help students meet unexpected expenses. The methodology for apportioning these*

funds, and for advertising their availability, should also be examined, with the welfare of under-represented students in the forefront of the discussion.

5. Expansion of the calculator across the University of California.

Over the longer term, we hope the calculator can be adopted by and adapted to the local conditions on our nine sister campuses in the UC system. While many costs will remain relatively constant, we expect highly place-specific ones like housing and transportation to vary considerably. We also hope the tool can be adapted to other categories of workers, including staff and faculty, and thus help inform decision making around the cost of living and attendance for workers UC-wide.

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