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A Comparison of Two Job Offers in Mathematics Education

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Many job seekers in higher education are unaware of how large a discrepancy there can be in terms of financial potential for mathematics education jobs in higher education. Recent research on this topic has focused on the base salary (Reys, Reys, & Estapa, 2013), but other financial factors have been left unstudied. Through two cases, the researcher demonstrates a large gap that exists in net pay when major financial factors beyond base salary are considered, specifically insurance and retirement benefits. This article will spur conversations among faculty and graduate students in mathematics education doctoral programs allowing mentors to draw from their own experiences when mentoring others in the search for a first or second job.

Key words: mathematics education, jobs, salary comparisons

Spring has traditionally been a time for posting jobs in mathematics education. Prospective mathematics education graduates begin looking for jobs, and departments seek to fill their ranks with the best of the job applicants as soon as possible. This has led many institutions to post jobs year round, and so for many job seekers in mathematics education it can seem like an urgent process. Consider the mathematics education listserv email service operated by Dr. Jerry Becker at Southern Illinois University. From July through December 2010, he forwarded 67 unique openings in faculty positions for mathematics education. In the 2011 calendar year, he forwarded 96 openings.

In this paper, the researcher seeks to illustrate the likely situation where an applicant has multiple job offers from various institutions that have made their best offers in terms of starting salary. This article focuses on jobs that entail teaching primarily undergraduate courses in mathematics education. Information about how to compare jobs in higher education, particularly mathematics education, are important because job openings are frequently available in the United States and candidates have historically been hired quickly (Reys, 2002; Reys, 2006). With the recent change in the worldwide economic climate, jobs seem scarcer than in the past partly because people are waiting longer to retire (Spanier, 2008) and because many institutions are leaving positions empty to cut costs. However, in 2012

there were 118 job announcements sent out from Dr. Becker's listserve, showing that even in a down economy the job market in mathematics education is still lively. Research on jobs in mathematics education has focused primarily on base salary (Reys, 2002; Reys et al., 2013). The question the researcher seeks to address here is: How do entry-level faculty positions in mathematics education compare when more than just the base salary is included?

Method

The researcher began collecting data during the job search process to share with future job candidates in mathematics education. Data for this study were collected in person from the human resources departments at two universities located in neighboring states. Job interviews at each of the two schools were conducted during two weeks in the spring of 2008. At each institution, a private interview was conducted with the director of human resources who described in detail the institution's benefits. Data were collected about retirement options and costs, as well as health and dental insurance options. Other factors, such as vision insurance, life insurance, and accident insurance were collected but excluded from the analysis because of their relatively small dollar amounts. Once the data were gathered, spreadsheets of the data were compiled and compared.

The researcher presents the two job offers that came from comparable universities. The positions shared many qualities such as research load, teaching load, university funding, and university support. In the following paragraphs, the researcher describes the two universities by their Carnegie Classification (http://classifications.carnegiefoundation.org/lookup_listings/) as well as the demographic information of their host cities from Wolfram Alpha (<http://www.wolframalpha.com/>), and uses a pseudonym for each university. All other information is factual.

Riverview University

Riverview is located in the United States in a city of approximately 55,000 people. It has easy access to an international airport and a moderate cost of living. Riverview has about 17,000 undergraduate students enrolled. Table 1 shows the Carnegie Classification for Riverview University.

Riverview offered approximately \$52,000 for a nine-month, tenure-track contract in a mathematics department within a College of Arts and Sciences. The teaching load would be reduced for the first year and after that a teaching load of 60% with the remaining 40% to be split between research and service, depending on the preference of the professor and any acquired grant funding.

Lakeside University

Lakeside is located in the United States in a city of approximately 60,000 people and has easy access to an airport and a moderate cost of living. Lakeside has an undergraduate student population of approximately 12,000. Table 2 displays the Carnegie Classification for Lakeside University.

Lakeside offered approximately \$50,000 for a nine month, tenure-track contract in a curriculum and instruction department within a College of Education. Similar to the previous offer, the teaching load would be reduced for the first year and after that a teaching load of 60% with the remaining 40% to be split between research and service, depending on the preference of the professor and any acquired grant funding.

Table 1
Carnegie Classification of Riverview University

Carnegie Classification	Category
Undergraduate Instructional Program:	Balanced arts & sciences/professions, some graduate coexistence
Graduate Instructional Program:	Postbaccalaureate comprehensive
Enrollment Profile:	Very high undergraduate
Undergraduate Profile:	Full-time four-year, selective, higher transfer-in
Size and Setting:	Large four-year, primarily residential
Basic	Master's Colleges and Universities (larger programs)
Community Engagement	Curricular Engagement and Outreach and Partnerships

Table 2
Carnegie Classification of Lakeside University

Carnegie Classification	Category
Undergraduate Instructional Program:	Balanced arts & sciences/professions, high graduate coexistence
Graduate Instructional Program:	Single doctoral (education)
Enrollment Profile:	High undergraduate
Undergraduate Profile:	Full-time four-year, selective, higher transfer-in
Size and Setting:	Large four-year, primarily nonresidential
Basic	Doctoral/Research Universities
Community Engagement	Curricular Engagement and Outreach and Partnerships

Analysis

Those who are unfamiliar with jobs in higher education, or without knowledge of careers and how they operate within the United States, may at first believe that the two offers seem nearly equal. While obvious to some, the pressure of deciding in a short time on a job can blind one to the intricacies of jobs in public institutions. The following analysis probes beyond base salary, looking at health and dental insurance costs as well as retirement.

Considering Insurance Options

Health care costs can be high, and Figure 1 displays the cost, per month, to an employee who chooses the most comprehensive health care package at Riverview or Lakeside. If one does not purchase insurance for a spouse or family, there is no cost at Riverview. Lakeside, on the other hand, costs just over \$100 per month. However, if one claims either a spouse or family, Riverview's premiums increase to \$349 and \$491 per month, respectively while Lakeside's premiums increase to \$276 per month for spouse or family. Both universities subsidize the cost of insurance, and these figures only represent the cost to the employee.

Dental costs look similar, as seen in Figure 2. For an employee not claiming a spouse or family, Riverview offers a no-cost dental insurance package. However, with a spouse or family included, Riverview charges \$25 and \$76 per month, respectively. Lakeside begins with about \$20 per month for single coverage, and then \$38 and \$61 for spouse and family.

Considering Retirement Options

The other category that influences a potential employee's pay is retirement. Retirement is not simply a deduction, but an investment that will return in time. Both universities allow employees to choose between a state retirement program and an independent retirement program. Each of these options has pros and cons, but an interesting situation arises here. The state options are considered first.

State Retirement Option. Riverview requires the employee to contribute 7% for the state option. However, Lakeside requires no contributions from the employee for either option, making full contributions on the employee's behalf. Table 3 shows the contributions made by both the employer and the employee in each program in each university.

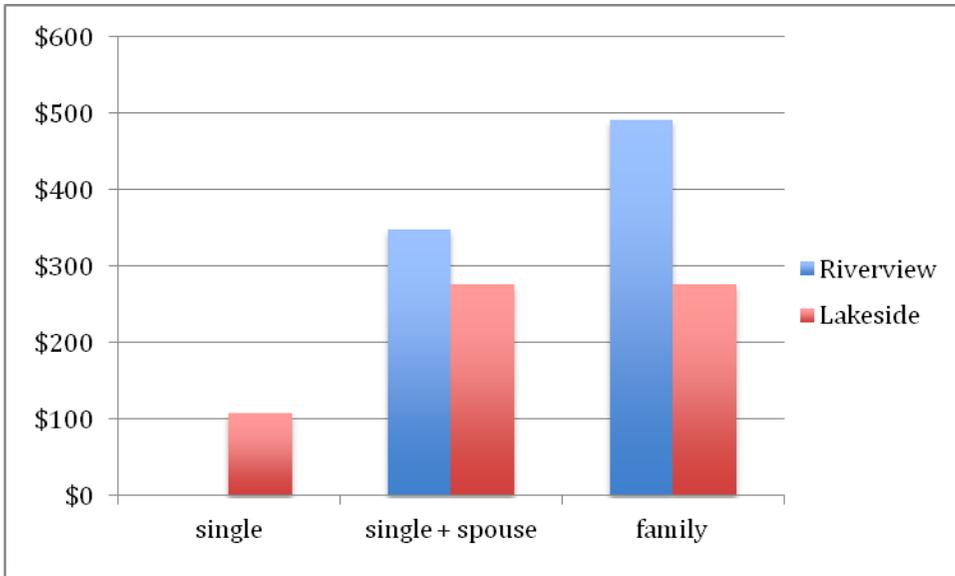


Figure 1. Health care costs in dollars per month based on marital status and family.

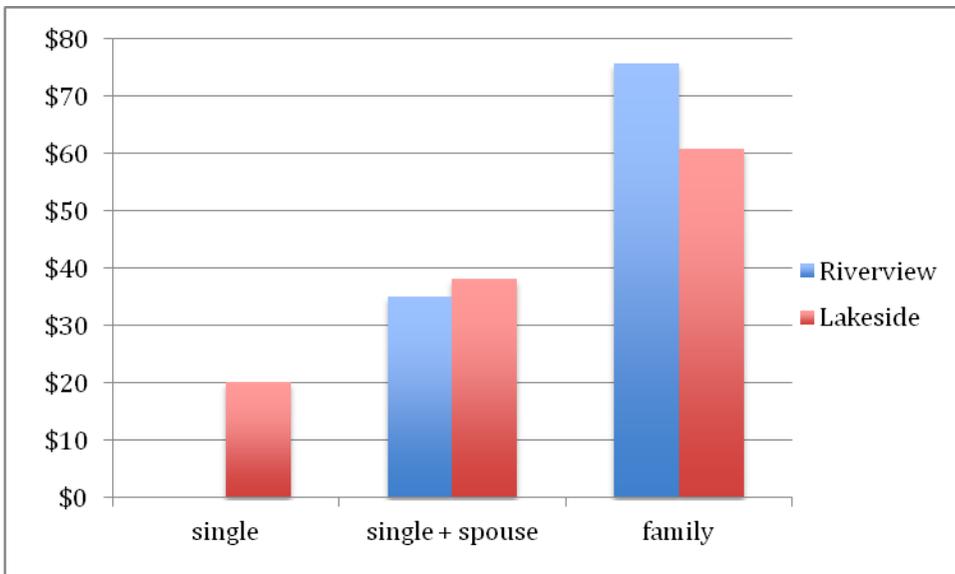


Figure 2. Dental insurance costs in dollars per month based on marital status and family.

Table 3
**Retirement Options and Costs, Considering both Contributions from
 the Employee and Employer, are Based on Offered Salaries**

Retirement Plan	Riverview University Contribution		Lakeside University Contribution	
	Employee	Employer	Employee	Employer
State Program	7%	14%	0%	13%
Independent	\$3640	\$7280	\$0	\$6500
Optional Plan	6%	9%	0%	10%
	\$3120	\$4680	\$0	\$5000

Note: Figures have been rounded to nearest whole number.

Independent retirement option. Riverview requires employees to contribute just over 6%, a slightly lower amount than what was required for the state retirement program. However, the combined contribution for employees at Riverview is about 15% (6% employee + 9% employer), which is more than the amount received at Lakeside. Lakeside does not require an employee to contribute to the independent retirement fund, but the employee could do so if desired. If an employee at Lakeside decided to contribute the same amount that Riverview requires, the Lakeside employee would place a full 16% (6% employee + 10% employer) of the base salary into the account. This means that $52,200 \times 15\% \approx \$7,800$ versus $50,000 \times 16\% = \$8,000$. In terms of retirement savings, Lakeside seemed to be a better choice despite having the lower base salary. Of course, a person choosing Lakeside would have to agree to contribute the extra 6%. Without this contribution, the retirement account would only receive \$5,000 the first year.

Financial Summary of Offers

Although Riverview offered the higher salary by over \$2,000, it is the lower line in Figure 3. This indicates that the job with the higher base salary is only financially superior if the employee is single in terms of insurance and benefits. Even for a future employee who is single, Lakeside's benefits and retirement costs are more favorable. Accounting for the costs of health and dental insurance, as well as the costs of retirement, a drastic gap in take-home pay emerges. In terms of percentage of the offered salary, a person claiming no spouse or dependents ends up with 97% of \$50,000 (\$48,500) instead of 94% of \$52,200 (\$49,068). An employee falling under the family option for the two jobs results in a comparison of 91% of \$50,000 (\$45,500) to 79% of \$52,200 (\$41,238). Based on salary and benefits alone, Lakeside and Riverview have presented two very different offers.

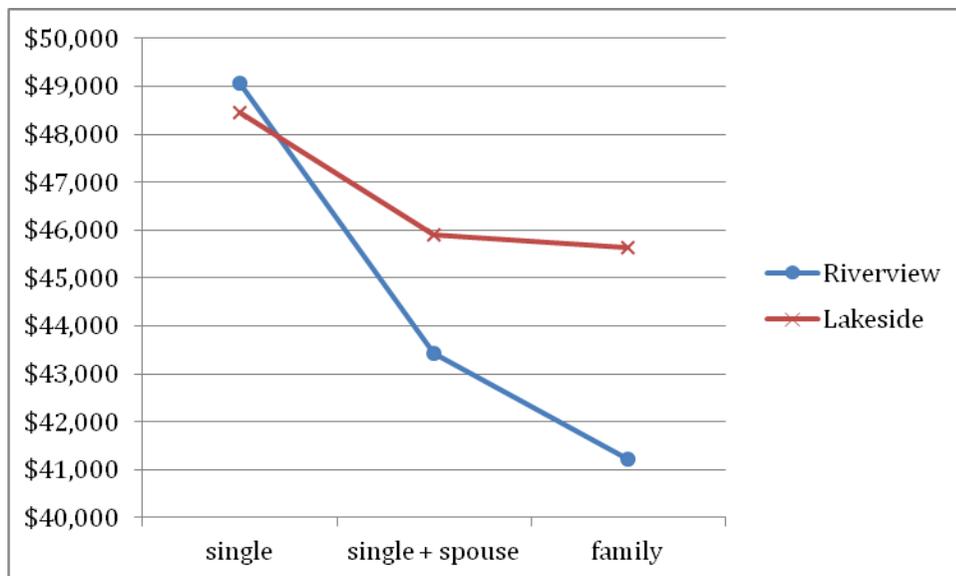


Figure 3. Net salary, before taxes, for incoming hires based on marital and family status.

Limitations

The complexities of a job increase if a spouse works at the same institution; this analysis does not probe to that level of detail. Many institutions charge different rates for insurance when both people are employed at the institution. Furthermore, this study assumes that all other factors were equal. This study assumes that one likes both institutions, feels both fit well professionally, and that both places offer a positive work environment.

Significance for Job Seekers

The information presented here is important in several ways. First, a professional group such as mathematics education needs to consider the stability of faculty lines. Many mid-sized and small universities often search unsuccessfully for a candidate. If after one or two years of searching, a job is finally filled, it is frustrating to have a new member leave after only one year (Reys, Glasgow, Teuscher, & Nevels, 2007). This process can disrupt the coherence of undergraduate programs in the preparation of teachers and contributes to the use of adjuncts for mathematics education courses.

Second, the number of graduate students coming from small programs is important (Bay, 2001; Reys, Glasgow, Ragan, & Simms, 2001). It is appropriate for an advisor or other professor to prepare his or her

students for the intricacies of careers in higher education. Sharing this commentary with graduate students could begin a conversation that would draw upon the experiences and expertise of many in the field. Those who do not have a mentor familiar with the jobs in mathematics education can use this analysis as a guide so that important questions can be asked during an interview.

It is appropriate and logical that all students who are graduating and seeking jobs in higher education are informed about potential salary packages and potential significant differences in them. This strengthens the profession against marginalization, especially in mid-size and small institutions. It also ensures respect for graduates wherever they chose to go.

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