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# Rethinking the Numerate Citizen: Quantitative Literacy and Public Issues – Reply

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# Rethinking the Numerate Citizen: Quantitative Literacy and Public Issues – Reply

## **Abstract**

In reply to Kira Hamman's discussion of my piece, "Rethinking the Numerate Citizen: Quantitative Literacy and Public Issues," I clarify that my argument is intended to apply only to public issues. I argue that problems requiring personal knowledge/expertise often benefit from quantitative literacy while describing the features of public issues that constrain the role of quantitative literacy.

## **Keywords**

quantitative literacy, public issues

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## **Cover Page Footnote**

Ander Erickson is currently Assistant Professor of Mathematics at Western Oregon University and will be Assistant Professor of Mathematics Education at University of Washington Tacoma in the Fall of 2017. He studies the introduction of information-literacy instruction into mathematics classrooms, quantitative literacy, and teacher decision-making.

I appreciate the opportunity to further explore some thorny issues surrounding the concept of quantitative literacy. Kira Hamman's thoughtful critique allows me to clarify a position that may have come across as needlessly extreme in my initial attempt to reconcile the concept of epistemic dependence with quantitative literacy. The point upon which my response turns comes down to the subject of my article, "*public problems*: questions that are publicly argued, consequential, and relevant to the citizen" (Erickson, 2016, 1). This type of problem does not include two of Hamman's most elaborated examples: financial literacy and, metaphorically, automobile safety. These examples are both specific to an individual's situation and, therefore, draw on what might be referred to as private knowledge. This knowledge, whether it refers to an individual's financial situation or the functioning of their automobile, is facilitated by more general quantitative (or automotive) literacy. In short, financial literacy does benefit from some knowledge of mathematics, just as a car owner will likely benefit from some experience with automobiles even if it is relatively superficial.

This sharpening of the domain of discourse brings us to the other example suggested by Hamman, a discussion of the costs of the wars in Iraq and Afghanistan. In contrast with the other two examples, this example is precisely the type of public problem that my argument was intended to address and so here is where we can locate some productive disagreement. What makes public spending on a war different than making a decision about how to save for one's own retirement? First, there is the nature of the expertise involved. There are relevant experts in both cases and it would behoove the savvy voter/consumer to hear what they have to say, albeit with a critical ear. However, in the case of financial decisions, you are the person who best knows what is at stake, what you possess, your intentions for the future, the type of decisions you are willing and able to make. You could hire a trusted financial advisor, but even if you were able to clearly communicate every pertinent piece of information to them, there is still the possibility that this financial planner may try to lead you astray, and so it will still be important for you to be able to recognize whether you are being talked into a decision that is not in your best interest. Thus, quantitative literacy has the potential to play an important role in your decision-making.

By way of contrast, public dilemmas, such as evaluating the spending on wars in Iraq or Afghanistan or the claim that the executive branch has "created more than almost 600,000 jobs" (Long, 2017, April 11) do not sustain the same relationship with quantitative literacy. I agree with Hamman that "when a population ceases to be able to judge for itself what is true and what is not, truth itself is threatened," but I disagree with her about the role of quantitative literacy in making those judgments. More importantly, I take issue with the implication that those without as much quantitative literacy are less able to make those judgments. I cannot speak for others, but I know that my knowledge, such as it is,

that the executive branch was not responsible for 600,000 new jobs in the first quarter of 2017 despite their claims to the contrary comes from my perusal of multiple sources that I deem to be reliable (Long 2017, Gaffey 2017) rather than my mathematical background. It is true that I may be able to spot misleading or erroneous quantitative claims, but here it is important to note that a single invalid argument would not be sufficient reason to discount the claim being made. In other words, a mathematical error by a journalist does not invalidate the conclusions that the journalist is reporting. Similarly, an entirely valid argument could be based on false premises, and so my ability to investigate the validity of the argument is of little use. The impotence of my efforts to make use of my mathematical knowledge in this context supports the idea that I should be engaging with multiple sources of information rather than relying on any single author – it does not suggest that I need to go about acquiring even more mathematical knowledge.

I recognize that even this qualified claim about the limits of quantitative literacy is going to be controversial to many, but I do still believe that quantitative literacy holds great importance for individual decision-making. In fact, I teach courses where the development of quantitative literacy is a primary goal, an elusive and complicated goal to be sure, but a goal that I embrace without reservation. There remains plenty of nuance when it comes to the question of what constitutes a functional quantitative literacy. Hamman provides an example on this point by noting an important distinction between learning the compound interest formula and the conceptual understanding of exponential vs. linear growth. However, the claim that voters are more likely to make bad decisions when they do not possess adequate quantitative literacy is a step towards the disenfranchisement of people based on the knowledge that they possess. Fortunately, this is one ethical dilemma that can be neatly sidestepped by recognizing that there are little grounds for making such a claim.

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