<b>AM Last Page: Avoiding Four Visual-Design Pitfalls in Survey Development</b> Anthony R. Artino, Jr, PhD, associate professor, Preventive Medicine and Biometrics, Uniformed Services University of the Health Sciences, and Hunter Gehlbach, PhD, associate professor, Harvard Graduate School of Education	
A previous AM Last Page <sup>1</sup> presented five common pitfalls of survey design as well as several solutions. This AM Last Page presents four visual-design and layout pitfalls and offers solutions.	
Pitfall: Explanation and Example	Solution: Explanation and Example
<b>Labeling only the end points of your response options</b> Labeling only the end points leaves the meaning of the unlabeled options open to respondents' interpretation. Different respondents can interpret the unlabeled options differently. This ambiguity increases measurement error. <sup>2</sup>	Verbally label each response option Labeling each response option increases consistency in the conceptual spacing between response options and increases the likelihood that all respondents will interpret the response options similarly. Additionally, the response options have comparable visual weight, so the respondents' eyes are not drawn to certain options.
How interesting did you find this clinical reasoning course?	How interesting did you find this clinical reasoning course?
	0 0 0 0 0
not at all extremely interesting interesting	not at all slightly moderately quite extremely interesting interesting interesting interesting
Labeling response options with both numbers and verbal labels Because of the additional information respondents must process, providing both numbers and verbal labels extends response time. <sup>3</sup> The implied meaning of negative numbers can be particularly confusing and may introduce additional error. For example, in the item below, learning "a little bit" seems incongruous with learning the amount of "-1."	<b>Use only verbal labels</b> In general, use only verbal labels for each response option. Doing so will reduce the cognitive effort required of your respondents and will likely reduce measurement error. <sup>2</sup>
How much did you learn in today's workshop?	How much did you learn in today's workshop?
-2 $-1$ 0 1 2	0 0 0 0 0
almost a little some quite a tremendous nothing bit a bit amount	almost a little some quite a tremendous nothing bit a bit amount
<b>Unequally spacing your response options</b> The visual spacing between options can attract respondents to certain options over others, which in turn might cause them to select these options more frequently. <sup>4</sup> In addition, unbalanced spacing of the response options can shift the visual midpoint of the scale. How much did you learn from your peers in this course?	Maintain equal spacing between response options Maintaining equal spacing between response options will reinforce the notion that, conceptually, there is equal space or "distance" between each response option. As a result, the answers will be less biased, thereby reducing measurement error. How much did you learn from your peers in this course?
0 0 0 0 0	almost a little some guite a tremendous
almost nothing a little bit some quite a bit a tremendous amount	almost a little some quite a tremendous nothing bit a bit amount
Placing nonsubstantive response options together with substantive response options Placing nonsubstantive response options such as "don't know," "no opinion," or "not applicable" together with the substantive options can shift the visual and conceptual midpoint of the response scales, thereby skewing the results. <sup>4</sup>	<b>Use additional space to visually separate nonsubstantive response options</b> Using additional space to visually separate nonsubstantive response options from the substantive options will align the visual midpoint with the conceptual midpoint, thereby reducing measurement error. <sup>4</sup> This recommendation is an important exception to the guidance above about maintaining equal spacing between response options.
How satisfied are you with the quality of the library services?	How satisfied are you with the quality of the library services?
0 0 0 0 0	0 0 0 0 0
not at all slightly moderately quite extremely not satisfied satisfied satisfied satisfied applicable	not at all slightly moderately quite extremely not satisfied satisfied satisfied satisfied applicable
<b>Disclaimer:</b> The views expressed in this article are those of the authors and do not necessarily reflect the official policy of the U.S. Department of Defense. <b>Reference:</b> 1. Artino AR Jr, Gehlbach H, Durning SJ. AM Last Page: Avoiding five common pitfalls of survey design. Acad Med. 2011;86:1327.	

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