1    On Gravitation and Learning

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Abstract

Here we study the relationship between gravitation and learning in young infants. We demonstrate a significant correspondence between the mass of a learning agent and their ability to learn in a series of novel word learning experiments. This has far reaching consequences for our understanding of development and the nature of intelligence and time.

*Keywords:* word learning, gravity, development, complex systems

Word count: X

<sup>18</sup> <div align="center">On Gravitation and Learning</div>

<sup>19</sup> <div align="center">**Introduction**</div>

<sup>20</sup> Here you're gonna want to start talking about what your paper is about and why
<sup>21</sup> someone should keep reading beyond the first sentence. You want to make it juicey and
<sup>22</sup> intruiguing, but careful, if there's too much juice the reader might drown.

<sup>23</sup> <div align="center">**On the Nature of Time**</div>

<sup>24</sup> Now that the reader is fully invested in your work and the questions that it's going to
<sup>25</sup> be tackling, you can start getting deep into the weeds and explain things in excruciating
<sup>26</sup> detail. If you want to throw some math in the mix, you do that by surrounding LaTex math
<sup>27</sup> expressions with $ signs, where in-line expressions like $2 + 2 = 4$ use only one dollar sign, and
<sup>28</sup> if you want an expression to be on it's own line, you surround the expression with two $
<sup>29</sup> signs, like so:

$$\zeta(s) = \sum_{n=1}^{\infty} \frac{1}{n^s}$$

<sup>30</sup> You're probably going to want to cite some people so that your reader doesn't feel like
<sup>31</sup> you're pulling all this stuff out of nowhere, make them feel like other humans have thought
<sup>32</sup> in similar directions and the broader scientific community considered their inquiries worthy
<sup>33</sup> of publication. To cite someone, you add a @ symbol before the bibtex entry title and
<sup>34</sup> surround that in square brackets like so (Sigman & Cecchi, 2002). If you want to cite
<sup>35</sup> multiple people at once in one instance, you do the same thing, but separate each paper with
<sup>36</sup> a semi-colon like so (Hills, Maouene, Riordan, & Smith, 2010; Hills, Maouene, Maouene,
<sup>37</sup> Sheya, & Smith, 2009; Steyvers & Tenenbaum, 2005). When you leave the square brackets
<sup>38</sup> out, then the citation becomes an in-text citation, which is useful if you want the names of

<sup>39</sup> the authors to be part of the flow of your prose, like if I want to say that Goodman, Dale,

<sup>40</sup> and Li (2008) did some cool work and the reader should know about it.

<div align="center">

## Methods

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<sup>42</sup> Now that you're past all the initial fluff of the paper, it's time to get down to brass

<sup>43</sup> tacks. What did you actually do? Let the reader know what's up.

### Study 1: Measuring the Gravitational Interaction of Learning Bodies

<sup>45</sup> Note that you can create sub-sub-sub-etc headings by adding more and more # signs.

<sup>46</sup> For the first study, we weighted different children, and then exposed them to a bunch of

<sup>47</sup> word/object pairings, and then tested how many novel words they learned at the end of

<sup>48</sup> training.

<sup>49</sup> **Results.** You're probably going to need to load the actual data that has all your

<sup>50</sup> results. You need to do this within R blocks, which you can insert with the shortcut

<sup>51</sup> option+command+I on Mac and ctrl+alt+I on Windows

<sup>52</sup> You can do this data loading at any point in the document (except in the header), so

<sup>53</sup> you could have loaded all the libraries and data at the very beginning, or wherever.

<sup>54</sup> Now you'll probably want to visualize the data you loaded, which is where ggplot

<sup>55</sup> comes in. This is the defacto standard library for plotting in R. You'll notice that at the

<sup>56</sup> very beginning of the article we imported a library called "tidyverse". This is where ggplot

<sup>57</sup> and a bunch of other really powerful R packages live. If you want to be a data wrangling

<sup>58</sup> and visualization wizard, learn tidyverse[1]

———
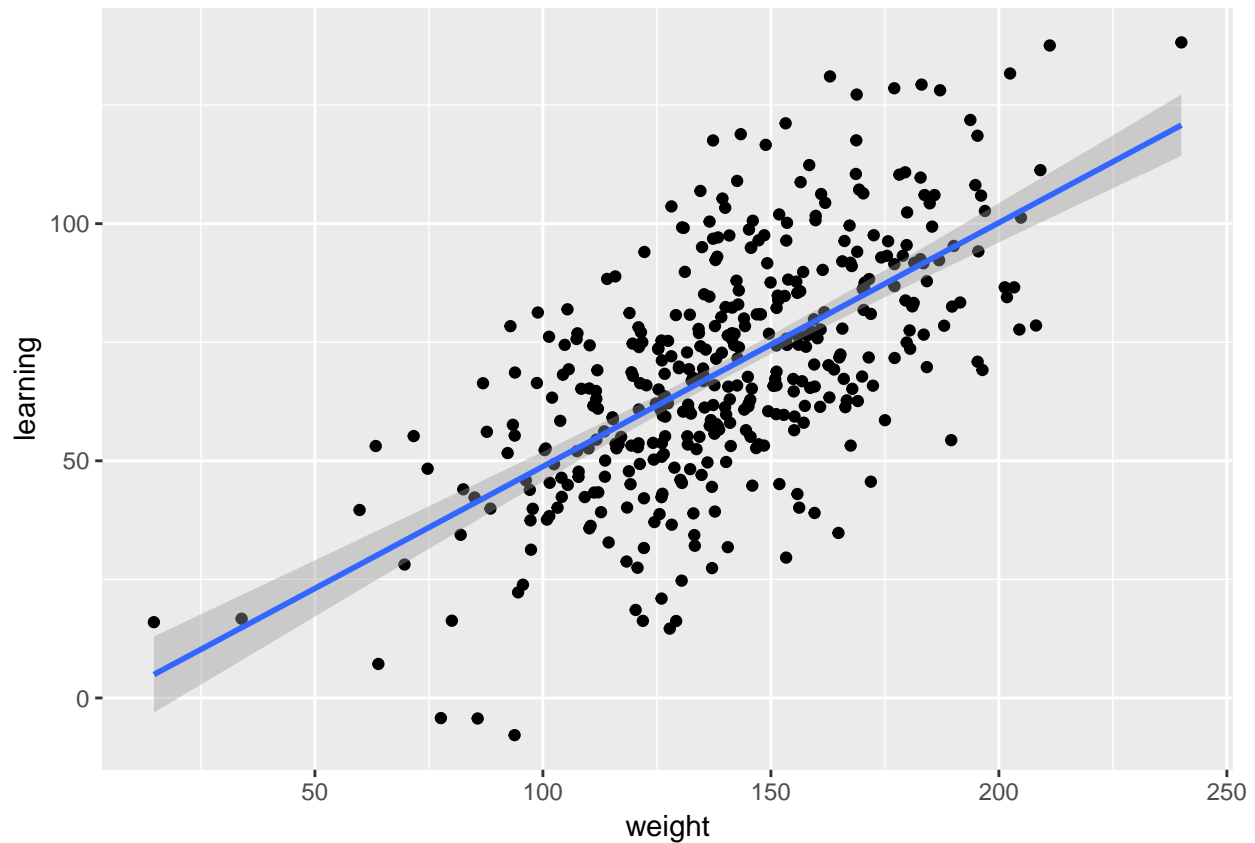
[1] `https://r4ds.had.co.nz/`

*Figure 1*. This is where you add the figure caption. You can also add information about the statistics that

⁵⁹ To insert a plot that's defined within an R chunk, you'll need to refer to is within your

⁶⁰ text. So you'll need to say something like, see Figure 1. By default the papaja package will

⁶¹ put these figures at the end, as that's what APA expects, but you can tell it to put the

⁶² figures within the text by setting the "floatsintext" parameter to "yes".

⁶³ Woah. It looks like the more mass that a organism has, the better they learn. Let's

⁶⁴ look at another plot that groups points by some categorical variable and tiles plots according
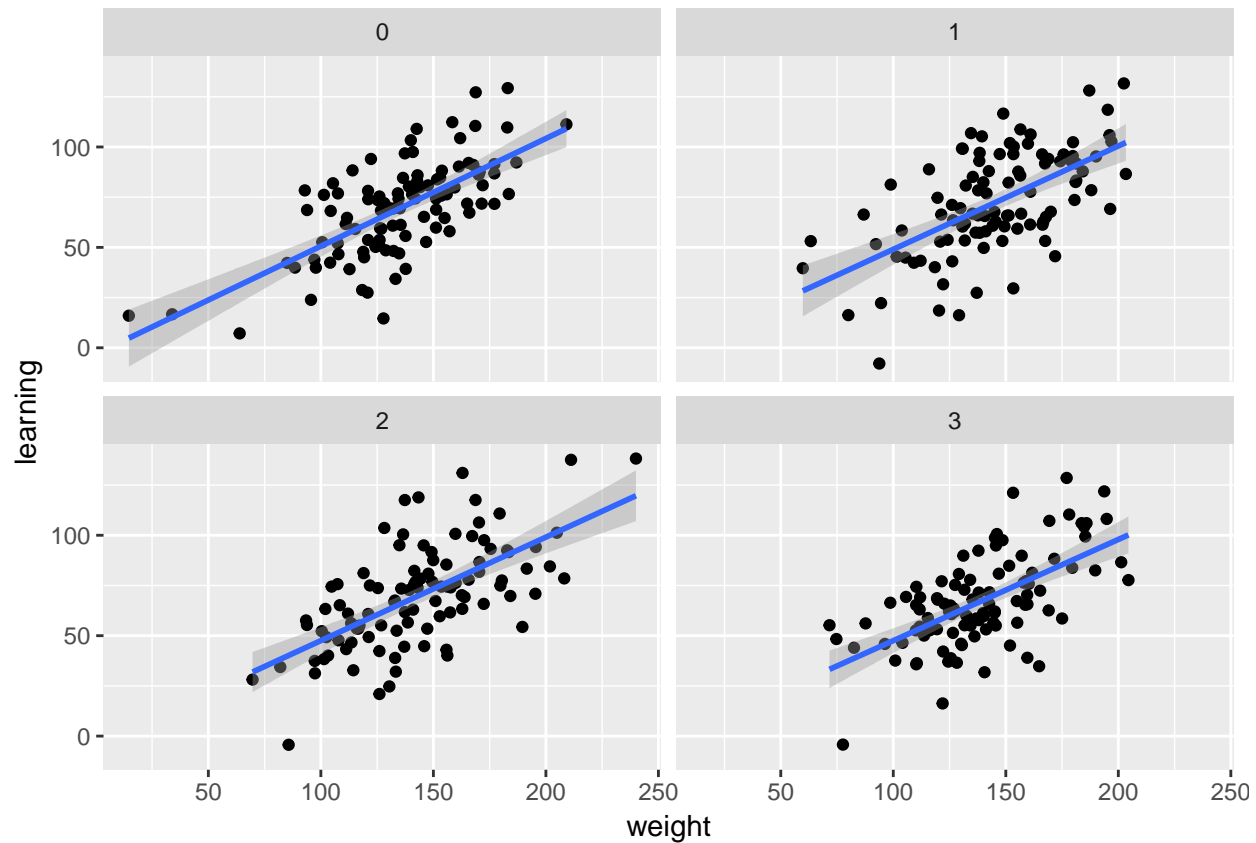
⁶⁵ to this grouping.

*Figure 2.* This is the same data as in the previous plot, except points have been grouped by what experiment they were in, where experiments are numbered 1-4.

# References

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