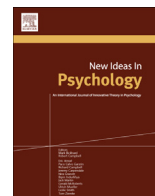




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## Historical impact in psychology differs between demographic groups



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## ABSTRACT

Psychology has a long tradition of creating lists of the most eminent members of the discipline. Such lists are typically created under the assumption that there is a general answer to the question of eminence, covering all psychologists everywhere. We wondered, however, to what degree perceived eminence depends on the individual's particular demographic situation. Specifically, are different historical figures "eminent" to people of different genders, ages, and geographical locations? We tested this by asking a wide swath of people – mostly psychologists – who they think has had the most impact on the discipline of psychology, historically. We used an online game in which "players" were shown a series of pairs of significant figures from psychology's past and asked to select which had had the greater impact. We then converted these selections into a ranked list using the Elo rating system. Although our overall rankings had considerable similarity with traditional efforts, we also found that rankings differed markedly among different demographic groups, undermining the assumption of a general measure of eminence that is valid for all.

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Fifteen years ago, Haggbloom et al. (2002) published a list of the 100 most eminent psychologists of the 20th century. The article has generated much attention: according to Google Scholar, it has been cited nearly 400 times. To compile their rankings, Haggbloom et al. relied on multiple means of determining eminence, combining journal citation counts, citations in introductory psychology textbooks, a survey of 97 APS members, awards and memberships in honorary societies, and the existence of eponyms (e.g., "Skinner box").

Haggbloom's top 20 can be found in Table 1.

This was by no means the first time that psychologists had tried to determine who, among their number, is the most eminent. Indeed, there have been nearly continual efforts to do so going right back to the first years of the 20th century (e.g., Annin, Boring, & Watson, 1968; Becker, 1959; Cattell, 1903, 1933; Coan & Zagona, 1962; Dennis, 1954a, 1954b; Garfield, 1992; Kaess & Bousfield, 1954; Knapp, 1985; Korn, Davis, & Davis, 1991; Myers, 1970; Ruja, 1956; Simonton, 1992; Tinker, Thuma, & Farnsworth, 1927). Many of the individual methods that Haggbloom et al. brought together had first been pioneered by one or another of these earlier authors. One thing they all had in common, however, was the assumption

that the final result would be singular, generally valid for all psychologists regardless of their own demographic situation (e.g., gender, age, location).

In the present project, by contrast, we wondered what would happen if the process of ranking historical figures were opened up to anyone interested in participating. This much wider population of people would include experts, of course, but the experts might well be out-numbered by individuals with a more casual interest in the topic: "ordinary" psychologists who are not departmental chairs and who do not specialize in the discipline's history, students who are taking history of psychology courses, perhaps even some people with little formal psychological training but with a personal interest in the matter nonetheless.

Our working questions were: (1) How would a list of psychological impact that had been "crowd-sourced" in this way compare to the "expert" lists that have been compiled in the past? (2) If there are differences between a list compiled in this way and the traditional lists, where would we find them? (3) Perhaps most interesting, would demographic sub-groups differ in their assessments of psychologists' eminence; e.g., Would men judge differently from women? Older people differently from younger ones? North Americans differently from Europeans and South Americans?

To obtain evaluations of the impact that various historical figures have had on psychology, we created a digital "game" that could be accessed on-line by anyone who wanted to play (see <http://elo.sha.nemart.in>). The first screen described the game and asked for

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**Table 1**

20 Most eminent psychologists in Haggblom et al. (2002).

1. B.F. Skinner	11. Gordon W. Allport
2. Jean Piaget	12. Erik H. Erikson
3. Sigmund Freud	13. Hans J. Eysenck
4. Albert Bandura	14. William James
5. Leon Festinger	15. David C. McClelland
6. Carl R. Rogers	16. Raymond B. Cattell
7. Stanley Schachter	17. John B. Watson
8. Neal E. Miller	18. Kurt Lewin
9. Edward Thorndike	19. Donald O. Hebb
10. A.H. Maslow	20. George A. Miller

consent to use the player's data in this research. Players who declined were allowed to play the game, but their data was not used in the present analysis. Players who granted consent were asked a few demographic questions (gender, age, past training in psychology) before playing the game. The game began with the player being shown the names of a pair of historical individuals associated with psychology. Attached to each name was a brief summary of his or her career, along with a link to the relevant *Wikipedia* entry, should the player wish to know even more. The player was asked to choose which member of the pair “had the greater impact on psychology.” As soon as the player chose one of the two names, s/he was presented with a new pair of names. The game continued in this fashion until the player decided to stop playing.<sup>1</sup>

The first name of each pair of historical figures was selected at random from a list of 402 significant individuals we had compiled. The second name was selected at random from among those figures whose score (see below) was within 150 points of the first one. The rationale for this selection procedure was that it maximized the number of close comparisons and did not waste players' time by having to choosing between figures of highly divergent import (except during the very earliest days of the game, before their score had begun to diverge). This is a common strategy when using the popular Elo rating system to generate rankings from paired choices, as we did. The Elo rating system was originally developed to generate rankings among chess players. It is now used to create rankings in many games and sports where rankings are required. It has also been used as the basis for “soft biometrics” (see e.g., [https://en.wikipedia.org/wiki/Elo\\_rating\\_system#Use\\_outside\\_of\\_chess](https://en.wikipedia.org/wiki/Elo_rating_system#Use_outside_of_chess)).

When one of our players indicated a preference for one of the two names in a pair, the Elo score for that name was incremented by a few points and the score of its counterpart was decremented the same number of points (generally 2 to 6 points, the exact value being determined by the Elo function). The Elo rating system generates a larger increment when an “underdog” beats a “favorite” (based on their current scores). All of the names in our pool started with an arbitrary score of 1200. This allowed them to move up or down as they won or lost without the scores falling into negative territory.

The list of names used was drawn from two popular biographical dictionaries of psychology (Sheehy, Chapman, & Conroy, 2002; Zusne, 1984). Our original pool included over a thousand names. We eliminated the names of nearly all of those who were active before the 19th century (How exactly does one go about comparing the relative impacts *on psychology* of, say, Thomas

Aquinas and Gordon Allport?). This left about 800 names. Initially, we intended to run the game using this list. When we pilot tested the game with a number of players, however, we received a common complaint that many of the names were unfamiliar even to players who were quite knowledgeable about psychology's past. This sapped motivation to play the game spontaneously (i.e., it was boring). We decided to remove the names of the figures who were deemed to be most obscure. We were left with a pool of 402 names. Naturally, other expert historians of psychology might have made somewhat different choices about borderline cases, but who was considered to be, e.g., 390<sup>th</sup> and who was 410<sup>th</sup> would have little impact on which historical individuals ultimately appeared anywhere near the top of the ranked list. A second round of pilot testing received more positive comments.

The game was publicly launched on September 16, 2015. We sent announcements to several e-mail lists dedicated to the teaching of psychology and to the history of psychology. These announcements briefly described the game, explained that it was also a research project, and urged recipients not only to play it themselves but also to pass information about the game on to their colleagues and students.

## 1. Demographics of the players

The response was quite strong. When we closed data collection for the present report on April 2, 2016, 66,852 ratings had been logged in across 892 distinct sessions.<sup>2</sup> (An additional 100 sessions, 10%, declined to have their data included in the study.) Typical sessions generated between 20 and 30 ratings. As can be seen in Fig. 1, the distribution was highly positively skewed. Only a very few sessions resulted in more than 500 ratings. One particularly enthusiastic player contributed 1637 ratings.

There were virtually identical numbers of male and female sessions (442 male, 443 female, along with 6 who described their gender as “custom”). Males tended to play somewhat longer, on average: the male median session was 33 ratings; the female median session was 22. As a result, the total number of ratings by males was 74% higher than the total number of ratings by females: 41,562 to 23,882, respectively.

The youngest player was 18 years of age. The oldest was 91. The boundaries between age quartiles were 30, 39, and 53. One could, thus, roughly characterize the age quartiles as people in their 20s, 30s, 40s, and 50+ (the mean age for the oldest quartile was 63.7 years). Each age quartile was composed of approximately 223 players (there was some variation in the frequencies due to ties). Older players tended to play longer than younger ones. The mean number of ratings for each of the age quartiles, from youngest to oldest was 38, 49, 79, and 130.

With respect to education level, 113 sessions indicated that the player was undertaking a bachelor's degree in psychology; 59 had completed one (and had not continued further). Two more did not report their level. These totaled 174 sessions, which we designated collectively as “undergraduates.” A total of 120 sessions were from players who were undertaking or had completed a master's degree in psychology (and not continued). A total of 485 sessions indicated that the player was undertaking or had completed a doctorate in the field. Ten reported some “other” level of education in

<sup>1</sup> Several players mentioned to us early on that they did not “know when to stop” playing. They had expected to reach a signal that the game was “over.” To address this confusion, after about 10 weeks, we inserted a message after every 25 pairs, telling them how many choices they had made and reminding them that they could stop at any time. This appeared to make little difference to how long they chose to play.

<sup>2</sup> “Sessions” are roughly equivalent to players. Each time a player starts playing, a new session is opened, corresponding to the web browser from which the person is playing. The session remains active until a month has passed without any activity. It is important to note that, in some cases, more than one session probably corresponded to a single player because that player either used more than one browser (e.g., home, work) or s/he stopped playing for more than a month before playing again.

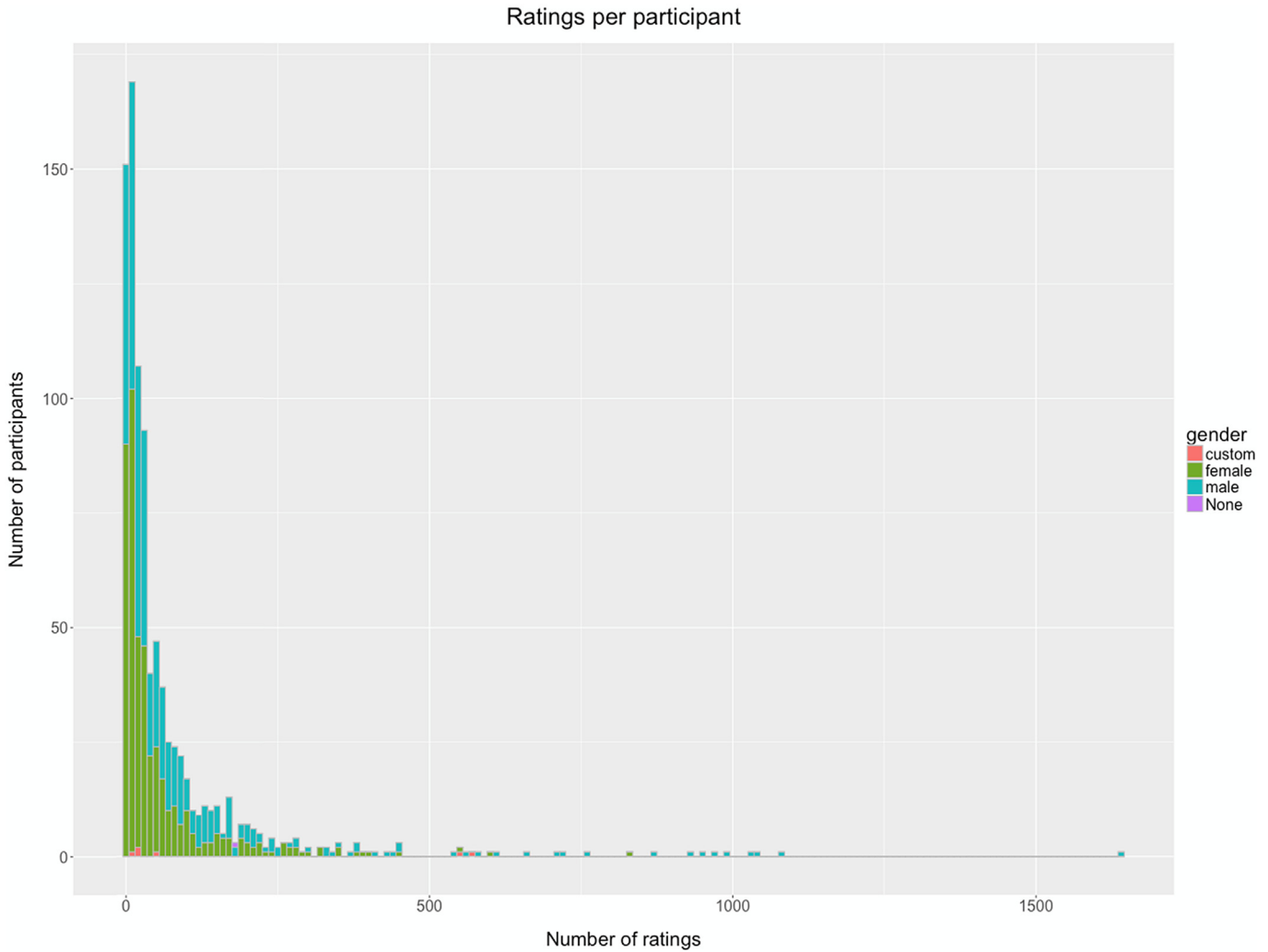


Fig. 1. Distributions of number of ratings per session.

psychology. An additional 103 reported having had no formal education in psychology.

From the IP addresses, we were able to determine the players' general locations. A total of 657 were in North America (including 539 in the U.S., and 109 in Canada). Another 111 were in Europe (including 30 in the U.K. 20 in Germany, 20 in Switzerland, and 15 in Spain). In South America, there were 104 (including 54 in Brazil and 32 in Argentina). There were just 14 from Asia and 6 from Oceania. The median number of ratings slightly favored European sessions: 35 for Europeans, 27 for North Americans, and 23 for South Americans.

**2. Overall rankings of impact on psychology**

The 20 historical figures with the highest ELO scores can be found in Table 2. (The complete ranked list of all 402 figures is in the Appendix.)

As can easily be seen, in some places the adjacent Elo scores were very close: e.g., the 1-point difference between James (1) and Skinner (2), and the 3-point difference between Loftus (11) and Milgram (12). In other places there were substantial gaps – e.g., the 38-point gap between Skinner (2) and Wundt (3), and the 30-point gap between Piaget (5) and Darwin (6). If one includes Asch among

**Table 2**  
Overall top 20 rankings and elo scores.

NAME	ELO SCORE
1. <b>William James</b>	1634
2. <b>B. F. Skinner</b>	1633
3. Wilhelm Wundt	1595
4. <b>Sigmund Freud</b>	1588
5. <b>Jean Piaget</b>	1570
6. Charles Darwin	1540
7. Ivan Pavlov	1537
8. <b>John B. Watson</b>	1504
9. <b>Albert Bandura</b>	1495
10. <b>Edward L. Thorndike</b>	1486
11. Elizabeth Loftus	1471
12. Stanley Milgram	1468
13. Hermann Helmholtz	1464
14. Harry Harlow	1460
15. Robert L. Thorndike	1453
16. <b>Abraham Maslow</b>	1451
17. <b>Hans Eysenck</b>	1443
18. Charles Spearman	1441
19. Lev Vygotsky	1438
20. Solomon Asch	1434

Bold names appeared in top 20 of Haggbloom et al. (2002).

the Americans,<sup>3</sup> there were 11 Americans and 9 Europeans in the top 20. Of the Europeans, 3 were British (Darwin, Spearman, Eysenck<sup>4</sup>), 2 were German (Wundt, Helmholtz), 2 were Russian (Pavlov, Vygotsky), 1 was Austrian (Freud), and 1 Swiss (Piaget). The only woman in the top 20 was Loftus (11).<sup>5</sup> Robert L. Thorndike (15) is a somewhat surprising inclusion. Although he had a highly successful academic career, he is rarely found in history of psychology textbooks. It is our speculation that many of our players confused him with his more eminent father, Edward L. Thorndike (and, thus, the elder Thorndike might have ranked somewhat higher on this list than the 10th place he achieved).<sup>6</sup>

Compared to the rankings of Haggbloom et al. (2002), only 9 of their top 20 overlapped with ours (James, Skinner, Freud, Piaget, Watson, Bandura, Edward Thorndike, Maslow, Eysenck). The remaining 11 of their top 20 were ranked lower on our list, though several were quite close to the top 20: Erikson (21), Rogers (25), Schachter (26),<sup>7</sup> Gordon Allport (28), Lewin (35), Festinger (40), R. B. Cattell (43), George Miller (61), Hebb (62), McClelland (113), and Neal Miller (161). Many of these discrepancies may be traceable to how the reputations of some psychologists and their work have fared during the first decade-and-a-half of the 21st century. For instance, R. B. Cattell's reputation suffered a serious blow during the controversy over his nomination for the APA's Gold Medal (see Tucker, 2009). David McClelland and Neal Miller are no longer as salient they once seemed. The fortunes of the two remaining members of Haggbloom et al.'s top 20 who fell below 40<sup>th</sup> place in our list – George Miller and Donald Hebb – are somewhat surprising to us: cognitive psychology, which is closely associated with Miller, remains a strong presence within the discipline, and Hebb's catch phrase – “neurons that fire together wire together” – has become the basis of an eponymous learning rule that is common in connectionist cognitive science.

A number of individuals who are standard figures in history of psychology textbooks and who are widely considered to have been quite significant to psychology's development did not appear in our top 20. These include G. Stanley Hall, the founder of the American Psychological Association and of the *American Journal of Psychology*, as well as a key advocate of adolescence as a crucial developmental stage. He ranked 23rd. The pioneering memory researcher Hermann Ebbinghaus was 24th. Philip Zimbardo, most famous for his “Stanford Prison Experiment,” was 27th. Pioneering mental tester and scientific journal magnate James McKeen Cattell was 29th. The founder of psychophysics, G. T. Fechner, was 30<sup>th</sup>. John Dewey, a founder of functionalism and a legendary educational theorist, was 31st. The founder of structuralism, E. B. Titchener, was 32nd. Binet, Wechsler, Lewin, Tolman, Hull, Chomsky, and Neisser filled out the 30s. Festinger, Terman, Kahneman, R. B. Cattell, Pearson, Galton, Tulving, Ekman, Jung, Broca, and Bowlby rounded out the top 50.

### 3. Comparing the rankings of different demographic groups

The most interesting result of the present study, however, came

not from the global rankings, but from comparisons between the ratings made by different demographic groups – gender, age, and geographic location. First of all, it is important to note that there was some degree of similarity among all the subgroups' assessments of impact. Fig. 2, for instance, shows a scatterplot of male vs. female Elo scores. It is easy to see that there is a strong linear association between the two sets of scores. The Pearson correlation between them was 0.721, accounting for just over half (52%) of the variance. (Although this value is statistically significant, with very large samples, such as ours (400 *df*), significance tests convey little information. The effect size is the relevant measure.) Despite this, the rankings showed many interesting differences as well.

#### 3.1. Gender differences

Table 3 shows the top 20 historical figures for each gender, side by side. Just 10 names appear on both lists: Skinner, Piaget, Freud, Bandura, James, Milgram, Wundt, Thorndike, Harlow, and Pavlov. Perhaps the starkest divergence was connected with Erikson, who ranked 2nd among women, but 94th among men. Another large discrepancy pertained to Adler, who ranked 13th among women but 115<sup>th</sup> among men. A third wide gap came with Floyd Allport, who was ranked 18th by women but 85th by men. There were a number of smaller differences as well. Maslow and Rogers ranked 6th and 8th, respectively, among women but only 37th and 64th among men. Spearman was 9th among women but 32nd among men. Robert Thorndike was 10th among women but 26th among men. Skipping over Loftus for the moment, Asch ranked 14th among women but 39th among men. (Eysenck was the victim of an arbitrary cutoff here, ranking 20th among women and 21st among men.)

Perhaps not surprisingly, Loftus was ranked somewhat higher by women (11th) than by men (36th). Interestingly, no other women appeared on either gender's top 20. Mary Ainsworth was the next highest female on both lists, ranked 28th by women and 41st by men. Sandra Bem was the 3rd highest female among women (31st overall) but Eleanor Gibson was the 3rd highest female among men (91st). (Conspicuously, Bem was only the 15th highest female figure among men, ranking a below-median 206<sup>th</sup> over all.) Generally speaking, women tended to rank female historical figures somewhat higher than men did. Of the 33 female historical figures included on the list, their mean ranking by women players was 121<sup>st</sup> whereas, by men players, it was 213<sup>th</sup>.

Looking to the men's rankings, the highest figure who did not appear in the women's top 20 was Darwin: 5th among men but 23rd among women. Watson, 6th among men, was 25th among women. These are both relatively modest discrepancies though. The first truly striking difference pertained to Clark Hull, who ranked 10th among men but 99th among women. Helmholtz, 11th among men, was 40<sup>th</sup> among women. Neisser, ranked 13th by men, was 133<sup>rd</sup> among women. Fechner, men's 14th choice, was 84th with women. Hall, 15th with men, was 47th with women. Gordon Allport, ranked 16th by men, was ranked 66th by women. (Interestingly, his older brother Floyd appeared in the women's top 20 but did not appear in the men's top 20). Lewin, 17th among men, was 85th among women. Schachter, 20th by men, was ranked 50<sup>th</sup> by women.

#### 3.2. Age differences

The top 20 for each of our four age cohorts can be found in Table 4. Correlations among Elo scores of the four age cohorts were somewhat lower than they had been among the two primary genders. The highest correlation, between the two oldest quartiles (40s, 50+), was 0.668 (45% of the variance). The lowest correlation,

<sup>3</sup> Asch was born in Poland but immigrated to the US at the age of 13.

<sup>4</sup> Eysenck was born in Germany, but moved to the U.K. as a teenager.

<sup>5</sup> Mary Ainsworth was 22nd. The next women were Eleanor Gibson at 75th and Anne Anastasi at 83rd. Early luminaries Margaret Floy Washburn and Mary Whiton Calkins were 89th and 91st, respectively.

<sup>6</sup> Edward Thorndike ranked 9th on the list of Haggbloom et al. (2002).

<sup>7</sup> Because one of the biographical dictionaries we used for our list of names gave an incorrect first name for Schachter, he was mistakenly eliminated from our list at the outset. We re-introduced him partway through the process, but he appeared in only about 70% the number of pairings that others at the top of the rankings did. Judging by the percentage of pairings he won (rather than his Elo score), it appears that he would have ranked only slightly higher if his name had been present throughout the data collection phase.



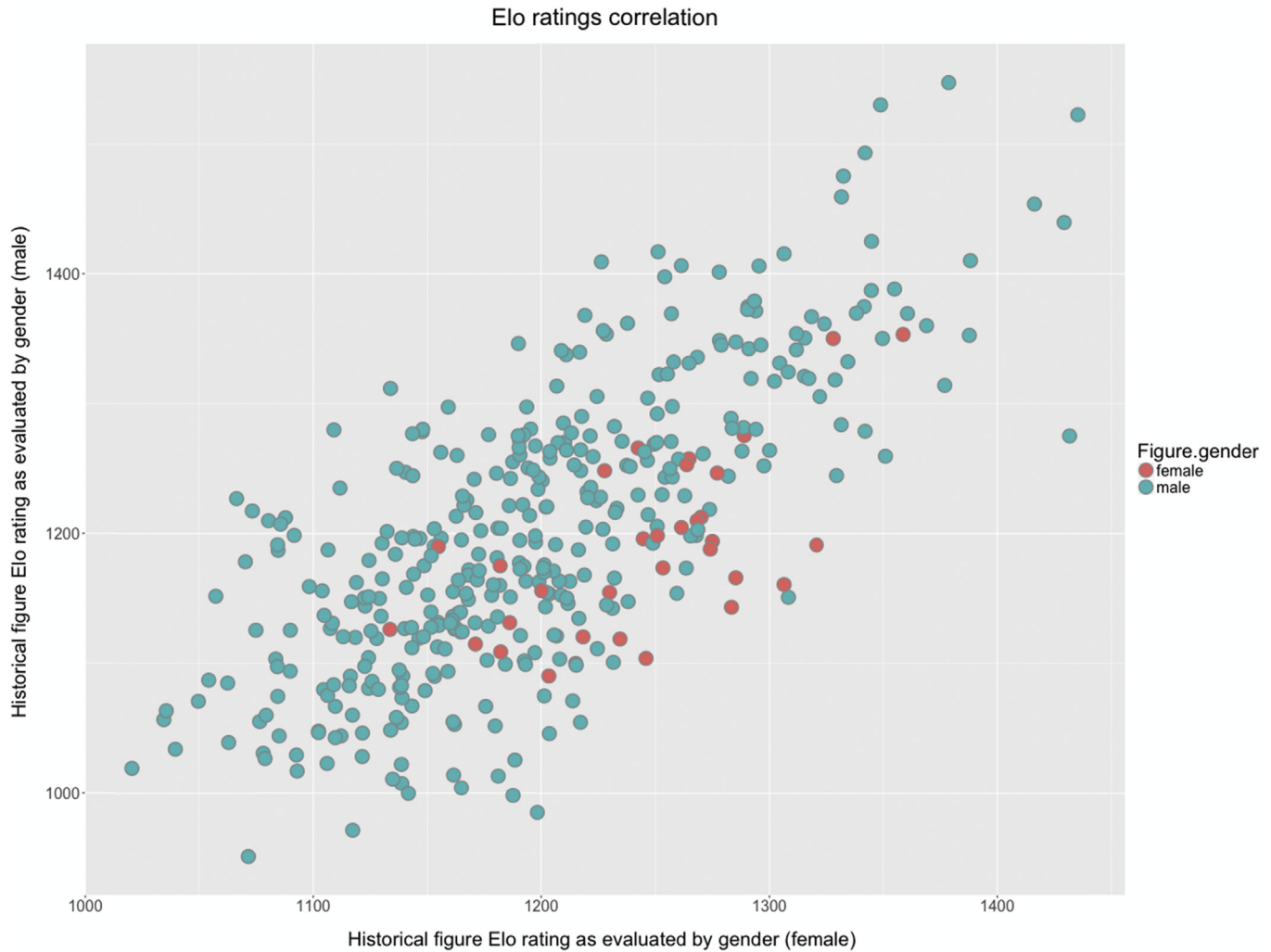


Fig. 2. Scatterplot of men's vs. women's ELO scores.

Table 3  
Top 20 rankings by gender.

Rankings by Women	Rankings by Men
1. <b>B F Skinner</b>	1. <b>William James</b>
2. Erik Erikson	2. <b>Wilhelm Wundt</b>
3. <b>Jean Piaget</b>	3. <b>B.F. Skinner</b>
4. <b>Sigmund Freud</b>	4. <b>Ivan Pavlov</b>
5. <b>Albert Bandura</b>	5. Charles Darwin
6. Abraham Maslow	6. John B. Watson
7. <b>William James</b>	7. <b>Sigmund Freud</b>
8. Carl Rogers	8. <b>Jean Piaget</b>
9. Charles Spearman	9. <b>Edward L. Thorndike</b>
10. Robert L. Thorndike	10. Clark Hull
11. Elizabeth F. Loftus	11. Hermann Helmholtz
12. <b>Stanley Milgram</b>	12. <b>Albert Bandura</b>
13. Alfred Adler	13. Ulric Neisser
14. Solomon Asch	14. Gustav T. Fechner
15. <b>Wilhelm Wundt</b>	15. G. Stanley Hall
16. <b>Edward L. Thorndike</b>	16. Gordon W. Allport
17. <b>Harry F. Harlow</b>	17. Kurt Lewin
18. Floyd H. Allport	18. <b>Stanley Milgram</b>
19. <b>Ivan Pavlov</b>	19. <b>Harry F. Harlow</b>
20. Hans Eysenck	20. Stanley Schachter

N.B. Figures on both lists appear in bold.

and 0.581 (23%–34%).

Only two historical figures appeared in the top 20 of all four age groups: B. F. Skinner and Sigmund Freud. Seven figures appeared in the top rankings of three of the four age groups. But for one notable exception, these figures ranked relatively well even with the group that did not place them in the top 20 (in parentheses): Wundt (51st), James (197<sup>th</sup>), Edward Thorndike (24th), Pavlov (29th), Watson (26th), Piaget (38th), Bandura (37th). Why the youngest cohort rated William James down near the median of our 402 historical figures is not clear. It is such a remarkable result that we are reluctant to place much stock in it until it is replicated.

Ten figures appeared in the top 20 rankings of only two age cohorts. The most interesting of these may be the ones who appeared in adjacent age cohorts, possibly indicating a figure who was important to one *generation* (i.e., two groups approximately one decade in width each) of raters but not as important to other generations. Vygotsky, for instance, was ranked very highly by the two younger age quartiles (1st, 4th), but he was ranked much lower by the two older quartiles (92nd, 65th). Not quite as discrepant, Maslow was in the top 20 for the two younger quartiles, but ranked 30<sup>th</sup> and 29th by the two older ones. Maslow's appeal across generations appears to be greater than Vygotsky's. Curiously, Robert Thorndike was ranked 3rd and 6th by the two younger quartiles but 42nd and 45th by the two older quartiles. This would seem to

between the youngest and oldest quartiles (20s, 50+) was just 0.415 (17%). The remaining four correlations were between 0.475

**Table 4**  
Top 20 rankings by age quartile.

20s	30s	40s	50+
1. Lev Vygotsky	1. <b>Jean Piaget</b>	1. <b>Sigmund Freud</b>	1. <b>William James</b>
2. <b>B. F. Skinner</b>	2. <b>Wilhelm Wundt</b>	2. <b>Albert Bandura</b>	2. <b>B. F. Skinner</b>
3. Robert L. Thorndike	3. <b>William James</b>	3. <b>William James</b>	3. <b>Ivan Pavlov</b>
4. <b>Wilhelm Wundt</b>	4. Lev Vygotsky	4. Mary Ainsworth	4. <b>Wilhelm Wundt</b>
5. Wolfgang Köhler	5. <b>John B. Watson</b>	5. <b>B. F. Skinner</b>	5. <b>Charles Darwin</b>
6. <b>Albert Bandura</b>	6. Robert L. Thorndike	6. Hans Eysenck	6. <b>Jean Piaget</b>
7. <b>Jean Piaget</b>	7. <b>B. F. Skinner</b>	7. <b>Charles Spearman</b>	7. <b>Sigmund Freud</b>
8. Philip Zimbardo	8. M. Merleau-Ponty	8. Noam Chomsky	8. Ulric Neisser
9. Hermann Helmholtz	9. <b>Albert Bandura</b>	9. Carl Rogers	9. Kurt Lewin
10. <b>Edward L. Thorndike</b>	10. Abraham Maslow	10. <b>Harry Harlow</b>	10. G. Stanley Hall
11. <b>Ivan Pavlov</b>	11. Carl Jung	11. <b>Hermann Helmholtz</b>	11. Solomon Asch
12. Alfred Kinsey	12. Immanuel Kant	12. <b>John B. Watson</b>	12. <b>Edward L. Thorndike</b>
13. Karl Pearson	13. <b>Hans Eysenck</b>	13. Stanley Schachter	13. J. J. Gibson
14. <b>Charles Spearman</b>	14. Jean-Martin Charcot	14. <b>Ivan Pavlov</b>	14. <b>Harry Harlow</b>
15. Thomas H. Huxley	15. <b>Edward L. Thorndike</b>	15. Endel Tulving	15. <b>Stanley Milgram</b>
16. <b>Abraham Maslow</b>	16. <b>Charles Darwin</b>	16. Michael Gazzaniga	16. Clark Hull
17. <b>John B. Watson</b>	17. <b>Stanley Milgram</b>	17. Erik Erikson	17. Gordon Allport
18. J. Mark Baldwin	18. Jean-Paul Sartre	18. Konrad Lorenz	18. Ernest Hilgard
19. Claude Bernard	19. <b>Sigmund Freud</b>	19. John Bowlby	19. Lewis Terman
20. <b>Sigmund Freud</b>	20. <b>Alfred Adler</b>	20. <b>Alfred Adler</b>	20. David Wechsler

**Red Bold:** 4 groups. **Blue Bold:** 3 groups. **Blue Light:** 2 groups. Gray: 1 group.

confirm our earlier suspicion that he was confused with his more eminent father, Edward, especially by younger raters, but not quite so often by older raters, for whom he is not so historically distant.

The figures who appeared in the top 20 rankings of only the middle two age cohorts were Eysenck (13th, 6th) and Adler (20th, 20th). Both figures were ranked much lower by both the youngest and oldest cohorts: Eysenck was ranked 70<sup>th</sup> and 52<sup>nd</sup>; Adler at 86<sup>th</sup> and 179<sup>th</sup>, respectively. Apparently these two figures have an eminence for psychologists in their 30s and 40s that they do not hold for either the youngest or oldest psychologists. The only figure who appeared in the top 20 just for the two older age cohorts was Harlow. The younger two cohorts ranked Harlow a distant 160<sup>th</sup> and 88<sup>th</sup>.

Four other figures made the top 20 in two non-adjacent age cohorts. There is no obvious interpretation to be made of this fact, but for the sake of completeness: Helmholtz and Spearman were ranked in the top 20 by only the first and third age quartiles; Darwin and Milgram were ranked in the top 20 by only the second and fourth age quartiles. Finally, 31 historical figures (39%) appeared in the top 20 of only one of these four lists. Only one woman appeared in the top 20 rankings of any of the four age cohorts. Somewhat surprisingly, it was not Loftus, the only woman to appear in the overall top 20. Instead, it was Ainsworth, who was ranked 4th by the 40s cohort.

### 3.3. Geographic differences

The top 20 historical figures, according to raters from each of the three continents from which we had sizeable representation – Europe, North America, and South America – can be found in Table 5. As before, there was some degree of general agreement among raters from different continents with respect to the rankings of the historical figures. The Pearson correlation between European and North American Elo scores was 0.529 (28%). The correlation between European and South American Elo scores was 0.505 (26%). The correlation between North American and South American Elo scores was somewhat lower than the other two, at just 0.405 (16%).

There were also marked regional differences with respect to which figures were seen as having the greatest impact on psychology.<sup>8</sup>

Looking through the three lists, their diversity is quite noticeable. Interestingly, the person judged to have had the most impact on psychology by European raters was an American, Philip Zimbardo, a figure who was ranked 46th by North Americans and 121<sup>st</sup> by South Americans. Robert Thorndike, another American, was ranked 2nd by Europeans. He also appeared in the top 20 among North Americans (19th) and South Americans (15th). (Again, the question of confusion with his father, Edward, arises here.) Europeans selected the Polish-British social psychologist Henri Tajfel in 3rd, though he appeared in a lowly 253<sup>rd</sup> position among North Americans (well below the median), and at 138<sup>th</sup> among South Americans. Eysenck was 4th among Europeans, the third figure out their top four who failed to place in the top 20 of either of the other two lists (27th for North Americans, 92<sup>nd</sup> for South Americans).

The top 5 for Europeans was rounded out by Pavlov, who finished in nearly the same position among North Americans (6th) and just out of the top 20 (21st) among South Americans. Other Americans who finished in the European top 20 but did not make the corresponding North American list included: Gordon Allport, Richard Lazarus, Paul Ekman, and Mary Ainsworth. European figures who did not appear on other lists included John Bowlby, Melanie Klein, Francis Galton, and William McDougall (who spent much of his career in the US). The dominance of English figures here is probably due to the fact that the largest contingent of Europeans who participated was British. There were few French raters (this initial version of the game was in English only) and, thus, no French figures appeared on the European list (though one appeared on the South American list, as we observe below).

The North American top 20 list was quite different. It began with two Americans – Skinner, who also appeared in the South American top 20, and James, who also appeared on the European top 20. These two were followed immediately by five European figures: Wundt, Freud, Pavlov, Piaget, and Darwin. Interestingly, Wundt and Darwin did not appear on the European list. It has sometimes been argued that the Americans took Wundt more seriously than even the Germans themselves did because of the large number of early American psychology students who trained with Wundt (whereas Germans and other Europeans tended to view him as just one

<sup>8</sup> It is worth recalling that there were about 6 times as many North American (657) sessions as there were European (111) or South American (104) sessions.

**Table 5**  
Top 20 rankings by raters' continent.

Europe	North America	South America
1. Philip Zimbardo	1. B. F. Skinner	1. Lev Vygotsky
2. <b>Robert L. Thorndike</b>	2. William James	2. Wilhelm Wundt
3. Henri Tajfel	3. Wilhelm Wundt	3. Henri Piéron
4. Hans Eysenck	4. Sigmund Freud	4. Karl Jaspers
5. Ivan Pavlov	5. <b>Jean Piaget</b>	5. Kurt Lewin
6. Gordon Allport	6. Ivan Pavlov	6. Aleksandr Luria
7. John Bowlby	7. Charles Darwin	7. <b>Jean Piaget</b>
8. Sigmund Freud	8. Albert Bandura	8. Wolfgang Köhler
9. Melanie Klein	9. Elizabeth Loftus	9. Charles Darwin
10. William James	10. <b>John B. Watson</b>	10. <b>John B. Watson</b>
11. Edward L. Thorndike	11. Harry Harlow	11. Erich Fromm
12. Richard Lazarus	12. Edward L. Thorndike	12. Édouard Claparède
13. Francis Galton	13. Erik Erikson	13. Herbert Spencer
14. Paul Ekman	14. Hermann Helmholtz	14. Aleksei Leontiev
15. <b>Jean Piaget</b>	15. Solomon Asch	15. <b>Robert L. Thorndike</b>
16. <b>John B. Watson</b>	16. G. Stanley Hall	16. Max Wertheimer
17. Stanley Milgram	17. Stanley Milgram	17. Alfred Binet
18. William McDougall	18. James McKeen Cattell	18. Albert Bandura
19. Mary Ainsworth	19. <b>Robert L. Thorndike</b>	19. B. F. Skinner
20. Charles Spearman	20. Charles Spearman	20. Gustav Jahoda

**Red Bold:** 3 groups. **Blue:** 2 groups. **Black:** 1 group.

significant figure among several other prominent contemporaries, especially Carl Stumpf and G. E. Müller). This appears to be borne out in our ratings (though it is worth noting that neither Stumpf nor Müller appeared in the European top 20). The next five on the North American list were themselves North Americans – Bandura, Loftus, Watson, Harlow, and Edward Thorndike. After the Danish-German-American psychoanalyst Erikson (13th) and the German polymath Helmholtz (14th), the balance of the list was comprised of North Americans – Asch, Hall, Milgram, J. M. Cattell, Robert Thorndike – except for the final position, which went to Englishman Charles Spearman (who appeared also at the bottom of the European top 20).

The South American list was quite different again. It was topped by Vygotsky, who appeared in the top 20 of neither of the other continents (39th among Europeans, 22nd among North Americans). Next came Wundt who, in turn, was followed by four figures not appearing on any other list: French psychologist Henri Piéron, German-Swiss psychiatrist Karl Jaspers, German-American psychologist Kurt Lewin, and Russian neuropsychologist Aleksandr Luria. These are notably high rankings for individuals who remained secondary even within their native Europe (Piéron 106<sup>th</sup>, Jaspers 72<sup>nd</sup>, Lewin 105<sup>th</sup>, Luria 138<sup>th</sup>). The same was true among North American raters (Piéron 318<sup>th</sup>, Jaspers 288<sup>th</sup>, Luria 104<sup>th</sup>) except for Lewin (32<sup>nd</sup>). In 7th place came the universally recognized Piaget, followed by the Gestaltist, Wolfgang Köhler. Gestalt theory seems to still be appreciated in South America because Max Wertheimer appeared in their top 20 as well (16th), whereas neither of these figures appeared in either of the other continents' top 20. After Darwin (9th) and Watson (10th) came four more European figures who appeared nowhere else: German-American psychoanalyst Erich Fromm, Swiss neurologist Édouard Claparède, English evolutionist Herbert Spencer, and Russian developmentalist Aleksei Leontiev. Again, these prominent figures in South America had much lower rankings in both Europe (Fromm 190<sup>th</sup>, Claparède 86<sup>th</sup>, Spencer 46<sup>th</sup>, Leontiev 154<sup>th</sup>) and, especially, in North America (Fromm 159<sup>th</sup>, Claparède 368<sup>th</sup>, Spencer 155<sup>th</sup>, Leontiev 335<sup>th</sup>). The South American list closed out with: Robert Thorndike, Wertheimer (on no other list), Alfred Binet (on no other list), Bandura, Skinner, and, finally, the Austrian-British cross-cultural psychologist Gustav Jahoda (on no other list).

Looking across the three continental lists, only Piaget, Watson, and Robert Thorndike appeared on all three. Ten figures appeared

on two of the lists: Pavlov, James, Freud, Edward Thorndike, Milgram, Spearman, Skinner, Wundt, Darwin, and Bandura. A total of 31 others (52%) appeared on one list alone, resulting in the significant diversity seen among the three lists.

#### 4. Discussion

What have we learned? Most important, our results seem to call into question a key assumption that underlay every other effort over the past century to create a ranked list of psychological impact or eminence. That assumption is that there is can be a single, general list of impact of eminence that applies equally to all psychologists. Statistics textbook regularly warn against the practice of including heterogeneous groups of scores in a single graph, such as a scatterplot (e.g., Howell, 2013). For instance, if one were to plot, for a mixed group of men and women, each person's interest in engineering and their interest in sports (on 10-point scales, say), one would likely find there to be a positive relationship between the two interests. But this would miss a critical factor, viz., that men and women tend to cluster in different regions of the plot (men higher on both interests, women lower on both), which drives an *apparent* relationship between the two interests. When the two genders are plotted separately, however, it becomes evident that this relationship is mostly an artifact of including the two gender groups together in the same plot. This can be easily demonstrated by showing that the statistical relationship mostly vanishes when each gender is plotted separately.

A similar phenomenon seems to have arisen in our data as well. A researcher can attempt to create a general ranking of impact or eminence for all of psychology in any way he or she chooses. In the final analysis, however, there are several heterogeneous demographic groups within the discipline of psychology and no single list will apply equally to them all. The discrepancies between women's and men's judgments of impact were fairly large, accounting for about half of the variance. For the four age cohorts, the differences were even greater, ranging from 55% to 83% of the variance. For the three geographical cohorts, the divergence was greater still, accounting for between 72% and 84% of the variance.<sup>9</sup>

There is no valid means of papering over these sizeable

<sup>9</sup> Using  $1-r^2$  as the measure in each case here.

differences with a general set of rankings. The views of each group must be taken on its own merits. That is, there is no general impact of historical figures across these demographic groups without misleadingly “averaging” across them. We must concede that it is simply the case that Erik Erikson has more impact for women (2nd) than he does for men (94th). Similarly, it is also the case that Vygotsky has more impact for younger psychologists (1st, 4th) than for older ones (92nd, 65th), and that Henri Tajfel has far greater impact for Europeans (3rd) than he does for either North or South Americans (253<sup>rd</sup>, 138<sup>th</sup>).

It is interesting to speculate somewhat further about what attracts the attention of different demographic groups to these figures (though these conjectures would obviously have to be confirmed by future research). Women seemed to perceive higher impact from developmental and therapeutic figures – such as Erikson, Maslow, Rogers, and Adler – than did men – who favored “harder” scientific figures such as Darwin, Watson, Hull, Helmholtz, and Fechner.<sup>10</sup> Women were also somewhat more likely than men to recognize the contributions of female historical figures (or perhaps we should say that men were somewhat less likely to recognize them), but the difference was not so great that more than one female figure appeared in the women’s top 20.

There were some marked differences between age cohorts. Younger groups perceived greater impact from developmental figures (Vygotsky, Baldwin), personal growth figures (Maslow, Jung), and even existential-phenomenological philosophers (Sartre, Merleau-Ponty). Older groups, by contrast, saw a continuing impact from more distant historical figures (James, Hall), from key cognitive figures (Chomsky, Neisser), as well as from the pioneers of American intelligence testing (Terman, Wechsler).

Perhaps the greatest demographic differences, however, were seen among people of different continents. It is interesting to note that the top five on each of the three continents contained *no common members at all* save Wundt, who appeared there for both the North and South Americans (but not the Europeans). More than half of the figures in the three continental top 20 lists, collectively, appeared on one list alone, not shared by either of the other two lists.

This raises an even broader question of whether what counts as “psychology” – what we learn when we study a topic of that name – is actually three distinct (though partially overlapping) disciplines on the three continents. It is worth noting, that these three continents actually share quite a lot culturally (no doubt because the North and South American cultures are largely products of European emigration). We have little idea how much more different corresponding lists of influential psychologists would be among Africans and Asians, except that the differences would almost certainly be even greater than we have seen here.

Green (2015) has argued that psychology is not a unified discipline because it began its life, in the late 19th century, as a disparate collection of ever-changing topics, methods, and writing styles that were cobbled together, first, by G. Stanley Hall and, later, by other journal owner-editors such as J. M. Baldwin and J. M. Cattell. There was no underlying “logic” or “structure” that would enable “psychology,” so-constructed, to come together into a coherent domain of study. However, Green was only considering the American form of the discipline. In the present era of growing interest in the “internationalization” and “indigenization” of psychology around the world (e.g., Brock, 2009; Leong, Pickren, Leach, & Marsella,

2012; Pickren, 2009), one can only imagine how much more varied the forms of study must be that are now collected together under the name “psychology.”

What should be done next? First, it might be interesting to know what level of background in the history of psychology our players have. In order to recognize, say, William James’ influence on the modern discipline, one has to first know something about William James and his writings on the topic. It is difficult to design a question about historical sophistication in a way that is both informative and brief enough not to bog players down. “Do you regularly read about the history of psychology?” “Have you ever taken a college-level course on the history of psychology?” “Do you consider history of psychology your academic specialty?” “Have you ever published a journal article on the history of psychology?” Calibrating the question correctly is a delicate business.

Second, the confusion between the two Thorndikes, Edward and Robert, seems to have been pervasive. The easiest solution would be to simply remove Robert Thorndike from the list. That may not be the best solution though. It might not be fair to him; he might well have legitimately ranked above many of the other 401 individuals in our pool of names. Some way must be found, however, to clearly separate the two in the minds of players. This “Robert Thorndike problem” also led us to also wonder what impact similar confusions might have had with respect to the brothers Allport, Gordon and Floyd, as well as to the two (unrelated) Cattells, James McKeen and Raymond B.

Third, and most important, the present project should be further internationalized. English-language North America was well covered, we think, but not the Spanish- or French-speaking parts of the continent. The South American data was invaluable, but it needs to be expanded to better represent countries beyond than Brazil and Argentina. The same is true of Europe, which was represented here mainly by Britain, Germany, Switzerland, and Spain. What of France, Italy, Scandinavia, and Eastern Europe? To accomplish this goal, versions of the survey framed in the languages of these countries would be required. Also important, though more complex, would be to acquire sizeable bodies of data from Africa and Asia, so that our international comparisons can become more inclusive. In addition to translating the game into a number of different languages, we would have to include the names of figures from these regions who are considered to have had high impact on psychology “there” (even if not “here”).

To conclude, historical impact is not a singular thing that extends homogeneously across the entire discipline. There are distinct, sizeable communities within the psychology for whom different historical figures have legitimately had greater impact than for other communities. Our efforts to measure impact should, going forward, include these differences so that we may attain a more accurate, more nuanced, more sophisticated understanding of our discipline and its history.

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#### Appendix A. Supplementary data

Supplementary data related to this article can be found at <http://dx.doi.org/10.1016/j.newideapsych.2017.04.001>.

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<sup>10</sup> We are, of course, well aware that Fechner had another side that was firmly anti-materialist and devoted to various spiritualist endeavors, but it seems obvious that it is primarily the psychophysics for which Fechner is best remembered by psychologists today, save a small cadre of historians.



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