Maclean's Magazine University Rankings (1998-2018): Consistency of Rank and Reputation in Canada

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Following 20 years of publishing rank and reputation scores for Canada's 49 institutions of higher education, the present analysis tested five hypotheses: (1) rank and reputation should be positively correlated across schools for each year; (2) rank and reputation should be positively correlated across the 20 years for each school; (3) a school's rank variance should be equivalent to a school's reputation variance; (4) previous reputation would predict current rank; and (5) previous rank would predict current reputation. Results showed that whereas rank corresponded roughly to reputation for a given school, there are noteworthy exceptions. One in seven schools offered a reliable correlation between rank and reputation, and four school correlations were negative. Rank and reputation variability correlated, though (marginally) better-ranked schools had stable reputation scores over the years. Implications for future ranking exercises are discussed, as are directions for future research.

Voilà maintenant 20 ans que l'on publie le classement et la réputation des 49 établissements d'enseignement supérieur canadiens. Dans cet article, nous examinons cinq hypothèses : 1) le classement et la réputation devraient faire l'objet d'une corrélation positive parmi les établissements d'année en année; 2) le classement et la réputation devraient faire l'objet d'une corrélation positive sur toute la période de 20 ans pour chaque établissement; 3) les variations dans le classement d'un établissement devraient se refléter dans les variations de la réputation; 4) l'indice de réputation antérieur permettrait de prévoir le classement actuel d'un établissement; et 5) le classement antérieur permettrait de prévoir l'indice de réputation actuel d'un établissement. Selon les résultats de notre analyse, bien que le classement et la réputation puissent être équivalents dans le cas d'un établissement en particulier, il existe des exceptions notoires. Dans le cas d'un établissement sur sept, il y a une corrélation sûre entre le classement et la réputation. Dans le cas de quatre établissements, la corrélation s'est montrée négative. Il y a une corrélation entre les variations du classement et de la réputation, quoique les établissements un peu mieux classés ont des indices de réputation plus stables au fil du temps. Nous présentons enfin les conséquences de ces résultats pour la conception de futurs palmarès et nous proposons des avenues pour la recherche.

Every November in Canada brings colourful leaves, reverted clocks, and the late-autumn chill with the promise of snow; it further marks the release of the special and widely popular "university ranking" edition of Maclean's Magazine. Since 1990, Maclean's has published the rankings of Canada's 49 institutions of higher learning in an effort to help readers make informed decisions about comparative strengths and weaknesses of Canada's public universities. Maclean's claims that they provide all the information needed to choose the right university. With the 20 pages of what is now Maclean's best-selling issue, readers can

discover which school boasts the most leaders of tomorrow, the most innovate graduates, or the most popular night scene. The present study offers an analysis of 20 years of institutional rank and reputation data so as to provide readers with a more critical and informed perspective of the rankings published by Maclean's Magazine.

The Business of Ranking

Maclean's rankings may be compared to similar methods employed by the publication Consumer Reports, in which products like cars and toasters are assigned comparative rank standings derived from appointed scores from various relevant indices. Many readers regard these scoring exercises as especially informative, basing their decision to purchase the product on these bias-free evaluations (Consumer Reports, n.d.). Furthermore, consideration is given to the reputation of the product manufacturer based on a variety of factors, including (but not limited to) reviews written by others who have purchased the products, how long the manufacturer has been in business, and the comparative cost of items produced.

The ranking of higher education institutions has arguably grown in popularity, and many implications have arisen for the ranked institutions (whether high or low), the surrounding communities, alumni, and certainly both current and prospective students (Cramer et al., 2016; Cramer & Page, 2007; Page, Cramer, & Page, 2009, 2010). The exercise has even grown popular in regions of the world outside of Canada and the United States (Murphy & Sage, 2014), and now includes Europe, Latin America, and Asia (see Times Higher Education, n.d.).

The exercise of ranking the numerous facets of any entity carries various limitations that warrant mention. To begin, ranking specialists must decide how best to resolve ties—whether by including averages or sharing the top, middle, or bottom ranks (Field, 2013). Furthermore, ranking necessarily reduces ratio- to ordinal-level data, which incurs loss of precision. This is akin to converting running times for marathon runners to the order (rank) of crossing the finish line (Field, 2013). Whereas ranking eliminates the influence of outliers, there may exist a large number of data points between two scores that are not reflected when using ranked data. For example, in ranking monetary amounts in library costs per student, there is a large number of potential data points between $1.00 and $29.99, but a small number of data points between $29.99 and $30.00—yet these may be ranked 3rd, 2nd, and 1st, respectively. Likewise, this can be applied to the practice of ranking educational institutions.

Beginning in 1991, Page, Cramer, and colleagues have challenged the validity of Maclean's university rankings—all of which produced largely insignificant and uninterpretable findings. Their analyses have consistently found that:

1. Individual indices correlated with overall rank a mere one-third of the time;
2. High- versus low-ranking schools were significantly different on approximately one-quarter of the indices; and
3. The cluster analysis produced largely meaningless and unintelligible (although empirically similar) families of institutions (see Cramer et al., 2016; Cramer & Page, 2007; Page & Cramer, 2001; Page et al., 2009, 2010).

Arguably, the implications of how administrators utilize these rankings will regrettably highlight a darker element, including outright fabrication of data in an effort to improve relative standing in Maclean's. For example, University of British Columbia administrators had pressured faculty to manipulate course enrollments and cap their class sizes so as to improve their standing with the magazine; moreover, they falsely reported that courses were offered by instructors with a Ph.D. when, in fact, graduate students were staffed to offer the course (Schmidt, 2004). Just as problematic, guidance counsellors and principals of secondary schools, as well as chief executive officers (CEOs), presidents, and executives of businesses are often invited to rate the relative reputation of Canadian universities despite little or no contact with the institutions. This is problematic as it is a method that accounts for roughly a quarter of

final total points awarded by Maclean's (Maclean's, 2019). The type of knowledge these raters have on the reputation of the various schools may be very limited, especially among lesser-known smaller schools such as Laurentian, Lethbridge, or Mount Saint Vincent. Consider one example from the US exercise in expert reputation rankings that compared their top law schools. Due in part to the halo effect of reputation, Princeton was awarded the top ranked law school in the US when, at the time, no such law school existed (Brooks, 2005).

Present Study and Hypotheses

Past research has acknowledged potential shortcomings within the validity of Maclean's rankings since most studies (Cramer & Page, 2007; Page & Cramer, 2001; Page et al., 2009, 2010—with the exception of Cramer et al., 2016) have investigated a single year of data, and it has been determined that a multi-year analysis would be beneficial. Thus, the present study selected what researchers deemed to be the most popular and impactful indices (rank and reputation) for each institution of higher learning across a period of 20 years. Given the general shift in rank and reputation over the years (due in part to institutional attention to optimal teaching and learning environments), we focused chiefly on how changes to one school's index might predict changes in the other. Thus, we offer the first 20-year examination of Maclean's university rankings (1998-2018), which aimed to determine:

1. The correlation across all institutions between:
    a. Rank and reputation for a given year;
    b. A given year's rank and the previous year's reputation; and
    c. A given year's reputation and the previous year's rank;
2. The correlation between rank and reputation for a given institution across all years;

3. A comparison of variance in rank to variance in reputation for a given institution across all years;
4. If current rank could be predicted from prior reputation; and
5. If current reputation could be predicted from prior rank.

Method

We collected the rank and reputation data for Canada's 49 institutions of higher education, divided into three categories:

1. 15 Medical/Doctorate Schools – largely medical and dental schools showcasing a broad-spectrum of graduate and professional degrees;
2. 12 Comprehensive Schools, offering several extensive graduate and professional degrees; and
3. 22 Undergraduate Schools – chiefly undergraduate offerings with limited graduate degrees available.

In 2010, the University of Ontario Institute of Technology (UOIT) was placed in the Undergraduate category. In 2011, the University of Quebec at Montreal (UQAM) was placed in the Comprehensive category. In 2012, each of Brock, Ryerson, and Laurier moved from the Undergraduate to Comprehensive category. Because of the change in categorical denominator (at least between Comprehensive and Undergraduate schools), we recorded the percentage of schools that performed better than a given school for each of rank and reputation. In short, higher percentages indicate poorer performance. For example, a percentage of 80% for a given school implied that 80% of other schools performed better in comparison to that institution.

For this study, we pursued five lines of analysis:

1. Comparing the average percentile rank to average percentile reputation for each school to identify any anomalies;
2. Evaluating the correlation between rank and reputation across the 20 years of data;

3. Comparing the variability (variance) in rank to variability in reputation across the 20 years data;
4. Using a 1-, 2-, 3-, 4-, and 5-lag correlation to predict current rank from prior reputation; and
5. Using a similar lag correlation to predict current reputation from prior rank.

Results

With a significance level (alpha) set to .05 for all analyses, a comparison of a school's average rank to their average reputation was performed across the 20 years of data (see Table 1). While a survey of rank to reputation shows reasonable comparability, several noteworthy exceptions were identified. For example, among Medical/Doctorate schools, a better rank than reputation average for the University of Ottawa (with a 22% difference favouring rank), and better reputation than rank average for both McMaster (16%) and Sherbrooke (16%) was observed. Among Comprehensive schools, a better reputation than rank average for Brock (19%), a better rank than reputation average for each of Carleton (17%), New Brunswick (15%) and Windsor (18%), and better reputation than rank averages for both Ryerson (57%) and Concordia (22%) was observed.

Table 1

Mean Rank and Reputation (Difference), Standard Deviation of Rank and Reputation (Ratio)

School	Mean Rank	Mean Rep.	Mean Diff.	Std. Rank	Std. Rep	Std. Ratio	F-stat	P*
Medical/Doctorate								
Alberta	37%	25%	12%	.058	.091	1.57	0.40	.989
British Columbia	21%	22%	0%	.065	.106	1.62	0.38	.992
Calgary	70%	71%	-1%	.167	.134	1.25	1.55	.130
Dalhousie	57%	67%	-10%	.177	.068	2.60	6.77	<.001
Laval	74%	79%	-4%	.088	.067	1.31	1.71	.085
Manitoba	97%	99%	-2%	.045	.033	1.39	1.93	.047
McGill	11%	15%	-3%	.076	.088	1.15	0.75	.768
McMaster	49%	32%	16%	.132	.050	2.66	7.05	<.001
Montreal	68%	66%	2%	.160	.099	1.61	2.60	.008
Ottawa	66%	88%	-22%	.093	.071	1.30	1.70	.087
Queen's	23%	33%	-10%	.071	.113	1.59	0.40	.990
Saskatchewan	79%	73%	6%	.155	.166	1.07	0.87	.642
Sherbrooke	82%	66%	16%	.174	.191	1.10	0.83	.680
Toronto	13%	14%	-1%	.067	.087	1.31	0.58	.916
Western	47%	48%	-1%	.187	.054	3.45	11.88	<.001
Comprehensive								
Brock	79%	60%	19%	.165	.229	1.39	0.52	.954
Carleton	61%	77%	-17%	.201	.118	1.70	2.89	.004
Concordia	83%	61%	22%	.134	.141	1.05	0.90	.607
Guelph	26%	20%	6%	.110	.046	2.41	5.80	<.001
Laurier	62%	54%	8%	.278	.290	1.04	0.92	.586
Memorial	46%	48%	-2%	.059	.087	1.46	0.47	.973

New Brunswick	56%	71%	-15%	.205	.104	1.97	3.89	<.001
Quebec/Montreal	82%	81%	1%	.184	.231	1.25	0.64	.701
Regina	74%	84%	-10%	.155	.107	1.44	2.09	.031
Ryerson	77%	20%	57%	.126	.175	1.39	0.52	.953
Simon Fraser	16%	23%	-6%	.113	.077	1.47	2.16	.025
Victoria	22%	34%	-12%	.100	.054	1.84	3.39	<.001
Waterloo	20%	9%	10%	.072	.044	1.62	2.62	.008
Windsor	81%	99%	-18%	.149	.061	2.44	5.96	<.001
York	65%	81%	6%	.148	.118	1.26	1.58	.120
Undergraduate								
Acadia	14%	14%	0%	.062	.093	1.50	0.45	.980
Bishop's	42%	53%	-11%	.177	.150	1.19	1.41	.191
Brandon	79%	88%	-9%	.118	.097	1.23	1.51	.147
Cape Breton	95%	95%	-1%	.089	.052	1.71	2.92	.003
Lakehead	66%	78%	-13%	.170	.099	1.71	2.93	.003
Laurentian	51%	60%	-8%	.213	.307	1.44	0.48	.969
Lethbridge	35%	30%	5%	.171	.122	1.39	1.94	.046
Moncton	71%	72%	-2%	.123	.170	1.38	0.52	.951
Mt. Allison	7%	12%	-5%	.039	.065	1.66	0.36	.995
Mt. St. Vincent	74%	67%	7%	.146	.222	1.31	1.73	.081
Nipissing	94%	94%	0%	.082	.056	1.47	2.15	.026
St. Francis X	32%	19%	13%	.151	.238	1.18	1.39	.198
St. Mary's	43%	48%	-5%	.090	.206	1.18	0.72	.798
St. Thomas	50%	53%	-3%	.329	.244	1.35	1.81	.065
Trent	27%	45%	-18%	.097	.143	1.48	0.46	.976
UNBC	23%	47%	-24%	.160	.139	1.15	1.33	.234
UOIT	61%	41%	19%	.119	.241	2.02	0.25	.944
UPEI	44%	59%	-15%	.167	.097	1.72	2.95	.003*
Winnipeg	49%	35%	14%	.177	.144	1.23	1.51	.147

Note: Higher Percentages imply poorer performance; the Degrees of freedom for all *F*-statistics were 48, 48; and * denotes a significant statistic following Bonferroni correction (p<.001).

Finally, among undergraduate schools, we observed better rank than reputation averages for each of Trent (18%), UNBC (24%), UOIT (19%), and UPEI (15%).

Secondly, we tracked the correlation between reputation and rank. When collapsing across schools, the correlations across the 20 years of data ranged from .60 to .96; this result is encouraging, since it implies that highly ranked schools boast a strong reputation. As shown in Table 2, when conducted for individual schools, the corrected correlations (based on a protected Bonferroni alpha level to guard against inflated Type I errors) were significant for only Brock, Laurentian, Laurier, Memorial, Saskatchewan, St. Francis, and St. Thomas (or a mere 1 in 7 [14%] of all schools). Worse still was uncovering four negative correlations for each of Acadia (r [18] = -.26), Laval (r [18] = -.36), New Brunswick (r [18] = -.13), and Winnipeg (r [18] = -.22); implying higher rankings corresponded to lower reputations.

Table 2

Correlation of Rank and Reputation by School

Medical/Doctorate	r	Comprehensive	r	Undergraduate	r.
Alberta	.34	Brock	.80*	Acadia	-.26
British Columbia	.34	Carleton	.51	Bishop's	.29
Calgary	-.05	Concordia	.31	Brandon	.56
Dalhousie	.09	Guelph	.21	Cape Breton	.21
Laval	-.36	Laurier	.80*	Lakehead	.47
Manitoba	.23	Memorial	.67*	Laurentian	.87*
McGill	.61	New Brunswick	-.13	Lethbridge	.56
McMaster	.25	Quebeck/Mtl	-.04	Moncton	.40
Montreal	.33	Regina	.02	Mt. Allison	.35
Ottawa	.47	Ryerson	.38	Mt. St. Vincent	.60
Queen's	.13	Simon Fraser	.59	Nipissing	.52
Saskatchewan	.70*	Victoria	.16	St. Francis X	.72*
Sherbrooke	.44	Waterloo	.32	St. Mary's	.36
Toronto	.64	Windsor	.27	St. Thomas	.78*
Western	.33	York	.47	Trent	.57
				UNBC	.31
				UPEI	.52
				UOIT	.09
				Winnipeg	-.22

Note: * denotes significant rank-reputation correlations following Bonferroni correction (p<.001).

Third, we expected that both rank and reputation should match reasonably well with respect to their variability; a less reasonable pattern would appear from an invariant reputation to a wildly variable ranking. Whereas the variance of the rank was moderately correlated with the variance of the reputation (r [47] = .622, p < .001), it was the ratio of the two variances that invited further analysis. The ratio of these two variances, presumed to be equivalent, derives an F-statistic using an analysis of variance (ANOVA, Field, 2013) that is distributed by one less the number of ranks and one less the number of reputations (48 and 48). For Medical/Doctorate schools, 5 showed significantly more variability in rank than reputation, yet just three remained significant after a Bonferroni correction: Dalhousie (F [48, 48] = 6.77, p < .001), McMaster (F [48, 48] +

7.05, p < .001), and Western (F [48, 48] = 11.88, p < .001).

Further exploration of how the variability matched with ordinal placement of a school was performed; specifically, whether schools that performed poorly were more variable in their evaluation over the years. The correlation between average percentile rank and variance of rank was positively correlated, albeit marginally (r [47] = .267, p = .0637). The data trended in the direction of showing that better ranked schools were unlikely to move much in their reputation across the 20 years. Alternatively, the correlation between average percentile reputation and variance of reputation was not significant (r [47] = .039, p = .79). This was further explored in a comparison of mean rank and reputation to the standard deviation of rank and reputation (see Table 3). Though largely insignificant,

Table 3

Correlation of Mean (Rank and Reputation) to Variance (Rank and Reputation) by School Category

Correlation	Medical/Doctorate (*n* = 15)	Comprehensive (*n* = 12)	Undergraduate (*n* =22)
Mean (Rank) ⎢ Var (Rank)	.387	.618	.086
Mean (Rep) ⎢ Var (Rep)	-.015	.541	-.115
Mean (Rank) ⎢ Var (Rank)	.112	.682*	.057
Mean (Rep) ⎢ Var (Rep)	.297	.727*	.089

Note: * denotes a significant correlation (p<.05).

the two significant correlations are noted between the mean rank and variance of reputation, r (10) = .682, p = .0298, and between mean reputation and variance of rank, r (10) = .727, p = .0172. This would suggest, for the comprehensive schools, that lower ranked schools have more variable reputation across the 20 years, and that lower reputation schools have more variable ranking across the 20 years.

Finally, in the assessment of the lag correlations between rank and reputation across time, the analysis was split in two (see Figure 1). The three school categories were collapsed given the consistent results among them. First, the current reputation based on the previous year's ranks was predicted, which ranged from a correlation of .739 for lag-1 to a correlation of .684 for lag-5. Secondly, the current rank based on the previous year's reputations was predicted, which ranged from a correlation of .731 for lag-1 to a correlation of .627 for lag-5.
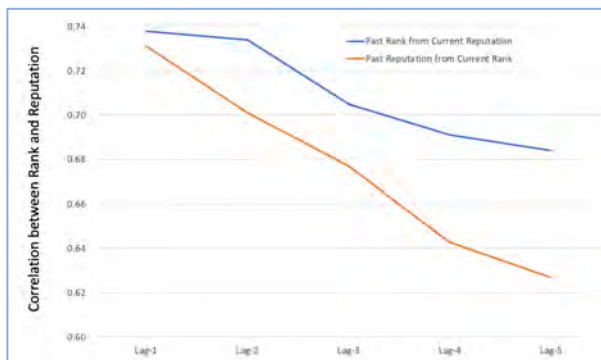

Figure 1

Correlations between Rank and Reputation for Lags 1 to 5

In short, the predictions in either current rank or reputation remained robust (albeit shrinking) with upwards of a 5-year lag. That is, predictions of rank grew less certain with additional years removed in reputation (and vice versa).

Discussion

The present study provided the first 20-year overview of the university rankings data for the years 1998-2018 in order to offer readers a more critical and informed perspective of the utility of university rankings published by Maclean's Magazine. Doubtless many readers would be able to make accurate and detailed observations regarding specific sets of scores in each index. Statistical calculations using the raw data to provide score-to-rank proximities are provided to assist readers in making a more informed decision.

To begin, the relation between rank and reputation across the 20 years of Maclean's data was examined. When analyzed by school, the results showed insignificant and largely inconsistent relationships within all three categories (Medical/Doctorate, Comprehensive, and Primarily Undergraduate) for a majority (42 of 49) of schools. A significant rank-reputation correlation was only observed for 14% of schools (1 in 7). When analyzed by year, the correlations between rank and reputation rested consistently at +.70 (explaining half the available variance). This suggests that whereas

reputation is arguably related to rank, the two are not interchangeable.

Disconcertingly, the correlation between rank and reputation was negative for four (8%) of the institutions. This remains especially problematic because, theoretically, one would expect an institution's rank and reputation to be positively correlated. In other words, if an institution's rank were to improve over time, one would not expect their reputation to simultaneously decrease (as some of the schools demonstrated). Presently, several inconsistent patterns, particularity between some of the largest and smallest institutions included in Maclean's rankings were identified (Belanger & Davidson, 1997). Specifically, the larger and more established institutions tend to perform better on Maclean's rankings, although even large high-ranking schools sometimes produce a low reputational grade (e.g., UNBC) and small low-ranking schools a high reputational grade (e.g., Ryerson).

After comparing variance (variability) in rank to variance in reputation for a given institution across the 20 years, 18 universities had significant differences in variability between rank and reputation. After correcting for multiple statistical tests, eight universities (Medical/Doctorate—Dalhousie, McMaster, and Western; Comprehensive—Guelph, New Brunswick, Victoria, and Windsor; and Undergraduate—UPEI) remained significant in variability between rank and reputation. In addition, the reputations of higher-ranked institutions did not move appreciably across the 20 years. An institution's rank and reputation should move in unison and have the same level of variability (hypothetically), much like the Canadian dollar and its intimate ballet with the price of copper (Evans, 2014). The lag analysis of ranks and reputations showed on the one hand that precision decreased over time, yet the decrease was not appreciable. It can be concluded that both rank and reputation tend to maintain long-term stability. The exercise of ranking Canadian institutions is not without limitations or repercussions which, in turn, may not only harm the institutions themselves but also their students, faculty, employees, and surrounding communities. Perhaps the most important is the impact of ranking on student well-being, regardless of attending either high- or low-ranking institutions. Huang et al. (2014) suggested the "famous school complex", in which students prefer to attend the best schools and be the best (or among the best) in that school. If one does not accomplish those simultaneously, issues with self-esteem and perceived intellectual ability could arguably emerge.

As an added implication, we cite the US cheating scandal which shines a light on how parents employed illicit means to ensure their children were enrolled in prestigious Ivy League universities. In less than a decade, wealthy parents have spent millions in bribes to facilitate their children's admission to universities such as Yale, Stanford, and the University of Southern California (Levenson & Morales, 2019). High-profile parents, at the advice of college preparatory executives, falsified crucial information and altered profiles, resumes, and CVs and claimed their children were top athletes (including photoshopped athletic photos; Newburger, 2019). Further details emerged that exam administrators had given students answers or corrected their work, and others had posed as the students to write the test on their behalf, all of which increased the Scholastic Aptitude Test (SAT) scores significantly, facilitating unmerited admission to some of the most prestigious universities in the US.

Conversely, Canada's lower-ranking institutions may experience diminished student interest and esteem, which could prompt difficulty in recruitment and enrollment on the heels of poor public impressions of the institution (Aghaz, Hashemi, & Atashgah, 2015). Clearly, organizations must manage their images effectively in order to remain successful (Polat, 2011). However, with Maclean's annual rankings, that may prove difficult for universities lacking the funds to boost public impression management. As demonstrated in the past, ranking may even encourage universities to provide misleading or inaccurate information in order to increase their standing with the magazine. Increased tuition fees may result as institutions attempt to produce the resources necessary to enhance their organizational image (Meredith, 2014).

The consequences of doing so not only harms the institution itself, but very likely harms the faculty, employees, and the surrounding communities as well.

Unlike the US system of vastly different levels (and qualities) of higher education (including 2-year and 4-year community colleges all the way up to Ivy League schools like Cornell and Yale), the field of Canadian universities is more uniform, differentiating minimally at the absolute level, but rendered unique at the ordinal or rank level following Maclean's exercise. As such, quality education may be found at any institution of higher learning. Still, the task before students and their family may lie principally in finding the right fit between student needs and career aims coupled with the offerings of a given school. Put simply, each school should not strive to be the University of Toronto, but rather strive to distinguish themselves (via unique programs or engaging teaching techniques) as suitable to each students' unique career goals. The exercise in ranking (already reasonably equivalent) schools may in fact highlight the critical pieces sought by students to select the correct school for them.

To include the students' voice in the matter of ranking, Cramer and Page (2007) surveyed university students to determine what indices should be included that would properly inform their decision to attend a given school. They found that while some original indices (found in the Maclean's survey) remained relevant (e.g., student to faculty ratio, instructors with a Ph.D., and bursaries), several did not (e.g., library holdings, number/size of medical grants) and still other novel indices were suggested (e.g., adequate parking, available daycare, and co-operative electives).

Characteristically, the "university ranking" edition of Maclean's Magazine encourages the creation of a hierarchy, or more accurately, a superfluous competition between already prestigious and analogous Canadian institutions. As demonstrated, Maclean's annual analyses using a rank-based approach to evaluate universities has offered inadequate practical use, differing from their continually advertised intentions, for over 20 years.

With respect to future directions, there are several available avenues open to researchers. First, one may continue the analysis into additional years to track the trends in ranks and reputations presently outlined. Second, individual institutional analysis might prove fruitful in an effort to examine the extent to which various policy changes and/or a multitude of other factors (such as national or global news reports) might impact an institution's rank and reputation. Finally, this study could be extended beyond Maclean's Magazine rankings of Canadian universities and analyses could be conducted to provide further insight into the systems used by any number of individual countries or a cluster of countries on a world-wide scale (for example, global rankings as published by Times Higher Education).

References

Aghaz, A., Hashemi, A., & Sharif Atashgah, M. S. (2015). Factors contributing to university image: The postgraduate students' point of view. *Journal of Marketing for Higher Education, 25*(1), 104-126. doi:10.1080/08841241.2015.1031314

Belanger, C. H., & Davidson, R. (1997). Ranking Canadian universities: A case of controversy. *Tertiary Education and Management, 3*(1), 44-51. doi:10.1080/13583883.1997.9966906

Brooks, R. L. (2005). Measuring university quality. *Review of Higher Education, 29*(1), 1-21. doi:10.1353/rhe.2005.0061

Consumer Reports. (n.d.). *Product reviews.* https://www.consumerreports.org/cro/a-to-z-index/products/index.htm

Cramer, K. M., & Page, S. (2007). Cluster analysis and rankings of Canadian universities: Misadventures with rank-based data and implications for the welfare of students. *Journal of Applied Multivariate Research, 12,* 183-198.

Cramer, K. M., Page, S., Burrows, V., Lamoureux, C., Mackay, S., Pedri, V., & Pschibul, R.

(2016). The marketing of Canadian university rankings: A misadventure now 24 years old. *Collected Essays in Learning and Teaching, 9,* 227-235. doi:10.22329.celt.v9i0.4434

Evans, P. (2014, July 9). Which way is the loonie headed? Watch the price of copper. Retrieved from https://www.cbc.ca/news/business/which-way-is-the-loonie-headed-watch-the-price-of-copper-1.2700932

Field, A. (2013). *Discovering statistics using IBM SPSS statistics* (4th ed.). London: Sage.

Huang, L., Chen, S., & Chien, C. (2015). The effect of university rankings on learning satisfaction: Social identities and self-identity as the suppressor and mediators. *Asian Journal of Social Psychology*, *18*, 33-42. doi:10.1111/ajsp.12064

Levenson, E., & Morales, M. (2019, March 13). Wealthy parents, actresses, coaches, among those charged in massive college cheating admission scandal, federal prosecutors say. Retrieved from https://www.cnn.com/2019/03/12/us/college-admission-cheating-scheme/index.html

Maclean's. (2019, October 3). *Canada's best universities by reputation: Rankings 2020.* https://www.macleans.ca/education/canadas-top-school-by-reputation-2020/

Meredith, M. (2004). Why do universities compete in the ratings game? An empirical analysis of the effects of the U.S. News and World Report College Rankings. *Research in Higher Education, 45*(5), 443-461. doi:10.1023/B:RIHE.0000032324.46716.f4

Murphy, T., & Sage, D. (2014). Perceptions of the UK's research excellence framework 2014: A media analysis. *Journal of Higher Education Policy and Management, 36*(6). doi:10.1080/1360080X.2014.957890

Newburger, E. (2019, March 12). Here's how the major college cheating scheme allegedly worked. *CNBC.* Retrieved from http://www.cnbc.com

Page, S. (2000). Ranking of Canadian universities: A new marketing tool. *Journal of Marketing for Higher Education, 10,* 59-70. doi:10.1300/J050v10n02_05

\Page, S., & Cramer, K. M. (2003). An update on the use of ranks in calibrating and marketing higher education. *Journal of Marketing for Higher Education, 13*(1-2)*,* 87-101. doi:10.1300/J050v13n01_06

Page, S., Cramer, K. M., & Page, L. (2003). Rankings of Canadian universities: Implications for students' academic welfare. *Guidance and Counselling, 18*(3)*,* 93-101.

Page, S., Cramer, K. M., & Page, L. (2009). The sophistry of university rankings: Implications for learning and student welfare. *Collected Essays on Learning and Teaching, 2,* 159-165.

Page, S., Cramer, K. M., & Page, L. (2010). Canadian university rankings: Buyer beware once again. *Interchange, 41*(1), 81-89. doi:10.1007/s10780-010-9110-7

Polat, S. (2011). The relationship between university students' academic achievement and perceived organizational image. *Educational Sciences: Theory and Practice, 11*(1), 257-262.

Schmidt, S. (2004, February 2). Students 'hurt' when schools try to impress *Maclean's*: UBC accused of capping class size to improve ranking. *Ottawa Citizen*, pp. A1-A2.

Times Higher Education. (n.d.). *World university rankings.* https://www.timeshighereducation.com/world-university-rankings

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