

# Comparison of chiropractic student lexicon at two educational institutions: a cross-sectional survey

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**Objective:** *To evaluate student perceptions of chiropractic cultural authority, role in healthcare and use of terms at two chiropractic institutions, the Canadian Memorial Chiropractic College (CMCC) and Parker University (Parker).*

**Methods:** *A unique survey was developed and administered electronically to Year 2-3 students (n=387) at CMCC and as a paper-based surveys to trimester 4-5 (comparison with Year 2) and 6-7 (comparison with Year 3) (n=277) students at Parker. Responses were anonymous. The survey assessed the likelihood that students at both chiropractic programs would use eight different chiropractic terms. The survey also assessed their preference toward different options with respect to chiropractic's cultural authority.*

**Results:** *Response rates were 36.2% and 78.1% at CMCC and Parker, respectively. Students at both institutions reported that chiropractic cultural authority*

**Objectif :** *Évaluer la perception des étudiants sur l'autorité culturelle de la chiropratique, le rôle dans les soins de santé et l'utilisation des termes dans deux établissements chiropratiques, le Canadian Memorial Chiropractic College (CMCC) et l'Université de Parker (Parker).*

**Méthodologie :** *Un sondage unique a été élaboré et envoyé par courriel aux étudiants de 2<sup>e</sup> et 3<sup>e</sup> année (387 étudiants) du CMCC et en format papier aux étudiants du trimestre 4-5 (en comparaison avec la 2<sup>e</sup> année) et 6-7 (en comparaison avec la 3<sup>e</sup> année) (277 étudiants) de l'Université de Parker. Les réponses étaient anonymes. Le sondage a évalué la probabilité que les étudiants des deux programmes de chiropratique utilisent huit termes chiropratiques différents. Le sondage a également évalué leur préférence pour différentes options en ce qui concerne l'autorité culturelle de la chiropratique.*

**Résultats :** *Les taux de réponses étaient de 36,2 % au CMCC et de 78,1 % à l'Université de Parker. Les étudiants des deux établissements ont déclaré que l'autorité culturelle en chiropratique était les soins*

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was ‘neuromusculoskeletal’ (NMSK); however, CMCC students was more favorable toward ‘musculoskeletal’ (MSK) care compared to Parker students, whereas students at Parker favored ‘wellness’ (59.7%) compared to CMCC students (46.4%). Students at CMCC were more likely to use ‘impingement’ and ‘joint dysfunction’ whereas Parker students were more likely to use ‘innate intelligence’ and ‘vertebral subluxation’. Both institutions were equally likely to use ‘spinal lesion’.

Conclusion: This survey found significant cultural authority differences between institutions. While this adds to the emerging need in the literature to evaluate the impact of curriculum and co-curriculum within chiropractic training programs on professional identity, explanations were not evaluated.

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KEY WORDS: chiropractic, cultural authority, lexicon, survey, terminology

## Introduction

It has been stated that the healthcare lexicon is more complex than the English language itself<sup>1</sup>, which should make it no surprise that *chiropractic* lexicon, a lexicon containing many unique terms, is often contested within the chiropractic profession itself and adds an extra layer of complexity to the entire profession. For example, in a 2005 study, authors were able to classify US schools as ‘liberal’ (“interested in mixing elements of modern and alternative therapies into chiropractic practice”) or ‘conservative’ (“chiropractors who believe in continuing the traditions of chiropractic”).<sup>2</sup> With differing educational viewpoints, one could assume that there would be differing and varying lexicon usage throughout the profession.

A 2013 Canadian study compared historical educational document lexicon to that of JCCA publications up until the 1950s.<sup>3</sup> The investigators found that the use of terms such as ‘subluxation’ and ‘adjustment’ (terms considered more ‘conservative’) had decreased over time and

« neuro-musculo-squelettiques ». Cependant, les étudiants du CMCC étaient plus favorables aux soins « musculo-squelettiques » contrairement aux étudiants de l’Université de Parker, qui eux étaient plus favorables aux soins « bien-être » (59,7 %) contrairement aux étudiants du CMCC (46,4 %). Les étudiants du CMCC étaient plus susceptibles d’utiliser les termes « impact » et « dysfonctionnement articulaire », tandis que les étudiants de l’Université de Parker étaient plus susceptibles d’utiliser « intelligence innée » et « subluxation vertébrale ». Les deux établissements étaient également susceptibles d’utiliser « lésion épinière ».

Conclusion : Ce sondage a révélé d’importantes différences d’autorité culturelle entre les établissements. Bien que, dans la documentation, cela s’ajoute au besoin émergent d’évaluer les répercussions du programme et du coprogramme d’études des programmes de formation en chiropratique sur l’identité professionnelle, les explications n’ont pas été évaluées.

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replaced with the evolution of language more commonly used in medicine (terms considered more ‘liberal’), suggesting a trend toward a shared lexicon across manual medicine professions.<sup>3</sup> Similarly, other reviews specifically investigating the use of the term ‘subluxation’, also referred to as ‘vertebral subluxation complex’ (VSC), within chiropractic literature reported its use as either infrequent<sup>4</sup> or not at all.<sup>5,6</sup>

By contrast, a 2003 survey of North American chiropractors ( $n=687$ ) reported that 88.1% of practicing chiropractors used the term VSC.<sup>7</sup> More recent surveys of chiropractic students in North America<sup>8</sup> and Australia/New Zealand<sup>9</sup> reported a preference for both (i) ‘conservative’ or traditional chiropractic theories and practices, which includes the VSC concept, as well as (ii) ‘liberal’ or exposure to evidence-based practice concepts. The authors of those studies suggested that, while this could be a potential degree of cognitive dissonance among chiropractic students, it could also be reflective of the spectrum

of diversity within the chiropractic profession to which students are being exposed. A deeper understanding of respective curriculums and environments may explain differences in student opinions.

To begin a deeper exploration of chiropractic institutions and the lexicon they preferentially use, the objectives of this study were to investigate students' perception of the profession's cultural authority, its role in healthcare and their use of specific chiropractic terms at two North American chiropractic institutions: the Canadian Memorial Chiropractic College (CMCC) and Parker University (Parker).

## Methods

This cross-sectional survey was approved by the Research Ethic Board at CMCC (1501X05) and the Institutional Review Board of Parker (#A-00151).

### Student Populations

Students at both CMCC and Parker were compared roughly midway in their educational training. Because CMCC is on a year calendar schedule with a total of four years and Parker is on a three semester (trimester) per year schedule with a total of 10 trimesters, the survey compared CMCC students in Year 2 with Parker students in trimester 4 and 5 and CMCC students in Year 3 with Parker students in trimester 6 and 7.

### Survey Questions

Based on a review of the chiropractic literature, the authors of an earlier study conducted at only CMCC<sup>10</sup> generated the list of chiropractic terms used in this study.<sup>11-17</sup> Using that list of terms, students were asked what their thought best defined the "cultural authority" of the profession: *musculoskeletal (MSK) expert*, *neuromusculoskeletal (NMSK) expert*, *wellness-based expert*, or *subluxation-based expert*. After that, students were asked which of the following terms best describes the "role of chiropractic in the health care delivery system": *primary care practitioners*, *portal of entry*, or *primary contact*.

Lastly, students were then asked which of the following chiropractic terms they would use: *vertebral subluxation*, *innate intelligence*, *dis-ease*, *spinal misalignment*, *nerve flow interference*, *spinal lesion*, *impingement*, and *joint dysfunction*. Based on our review of the literature, we concluded *vertebral subluxation*, *innate intelligence*,

*dis-ease*, *spinal mis-alignment* and *nerve flow interference* to be terms mostly used by conservative chiropractors whereas *spinal lesion*, *impingement* and *joint dysfunction* to be terms most likely used by liberal chiropractors. Specifically, students were asked how likely (or unlikely) they would be to use these terms using a 5-point rating scale, with 5 being 'very likely', 4 being 'likely', 3 being 'somewhat likely' 2 being 'unlikely' and 1 being 'very unlikely'. If a respondent indicated they were 'somewhat likely' (option 3), 'likely' (option 4) or 'very likely' (option 5) to use a particular term they were then prompted to indicate how likely they would use that term with different groups of people using the same 5-point rating scale). Options included: *Patients*, *Colleagues*, *Medical Doctors (MD)*, *Legal Proceeding*, or *Complementary Alternative Medical Providers (CAM)*. Respondents were able to choose more than one option. Definitions of the chiropractic terms used in this survey were not provided to students. The survey questions are provided in Appendix 1.

### Survey Distribution

The authors at CMCC administered the survey electronically via Survey Monkey to all Year II and Year III students during the 2014-2015 academic year. Survey Monkey only allows a respondent to reply to the survey once, based on their email address. The authors at Parker administered the survey via paper copies in June-July of 2016 during technique classes, since all students attended those classes. The authors at Parker ensured students only responded once to the survey. Both surveys were anonymous and confidential.

Both surveys included an informational letter that explained the purpose of the study and explained that the survey was anonymous and that its completion was voluntary. Consent was implied if the survey was completed.

### Statistical Analysis

Survey data from both chiropractic programs were compared using cross-tabulations and chi squared statistics in Stata (StataCorp 2013).<sup>18</sup> Data were converted to percentages for ease of reading. Descriptive statistics were used for demographic information.

## Results

Table 1 displays the response rates by student year with

the overall response rates as CMCC: 38.1% and Parker: 76.2%. The majority of students (82.6%) were between the ages of 21-29 (CMCC: 91.4% and Parker: 76.8%) and an almost equal distribution (overall male, 47.0%) of sex distribution (male, CMCC: 41.4% and Parker: 58.6%).

### *Cultural Authority (Table 2)*

Overall, 65.7% of CMCC students and 35.6% of Parker students endorsed the option of *MSK experts*, a statistically significant difference (chi-square=30.7, p-value<0.001). Responses from the two programs were more similar, but still statistically significantly different in distribution for the *NMSK expert* option, with 87.9% of CMCC and 74.4% of Parker students endorsing this option overall (chi-square=9.4, p-value=0.002).

For the option of *wellness-based expert*, Parker students were more likely to endorse this at 59.7% overall, whereas only 46.4% of CMCC students endorsed this option (chi-square=6.0, p-value=0.014). The last option, *subluxation-based expert*, was endorsed by 54.5% of Parker students, but only by 9.3% of CMCC students (chi-square=74.0, p-value<0.001).

### *Role of Chiropractic in the Health Care Delivery System (Table 3)*

Overall, 85.7% of CMCC students versus 74.1% of Parker students endorsed the option *primary care practitioners*, a statistically significant difference (chi-square=6.7, p-value of 0.01). There was a more pronounced and statistically significant difference between Year 3 student (CMCC: 85.6%, Parker: 70.9%, chi-square=6.4, p-value=0.011) respondents from both programs then the Year 2 students (CMCC: 86.1%, Parker: 76.2%, chi-square=1.8, p-value=0.185).

For *portal of entry*, 28.6% of CMCC students endorsed the term, as opposed to 44.6% of Parker students, indicating a significant statistical difference between programs (chi-square=9.1, p-value=0.003). In this case, there was not a statistically significant difference for Year 3 students (CMCC: 34.0%, Parker: 44.6%, chi-square=2.4, p-value=0.122) at each institution, but there was a significant difference for Year 2 students (CMCC: 16.3%, Parker: 44.6%, chi-square=10.5, p-value<0.001). Finally, there was no overall or stratified statistically significant difference between responses for *primary contact*.

Table 1.  
Response rates.

	CMCC	Parker
CMCC – Year 2 / Parker – Trimester 4 and 5	43/187 (23.0%)	101/150 (67.3%)
CMCC – Year 3 / Parker – Trimester 6 and 7	97/180 (53.9%)	110/127 (86.6%)
Overall	140/367 (38.1%)	211/277 (76.2%)

Table 2.  
Comparison of student responses from CMCC and Parker to question on cultural authority.

Cultural Authority	CMCC	Parker
MSK	64.4%	33.6%
NMSK	87.9%	74.4%
Wellness-based	47.1%	59.7%
Subluxation-based	9.3%	56.3%

Table 3.  
Comparison of student responses from CMCC and Parker to question on role of chiropractic in healthcare.

Role in Health Care	CMCC	Parker
Primary Care*	85.7%	74.1%
Primary Contact+	44.2%	36.8%
Portal of Entry <sup>^</sup>	28.6%	44.6%*

p<0.05% (overall and Year 3),

+ No overall or stratified statistically significant difference,

<sup>^</sup> p<0.05% (overall and Year 2)

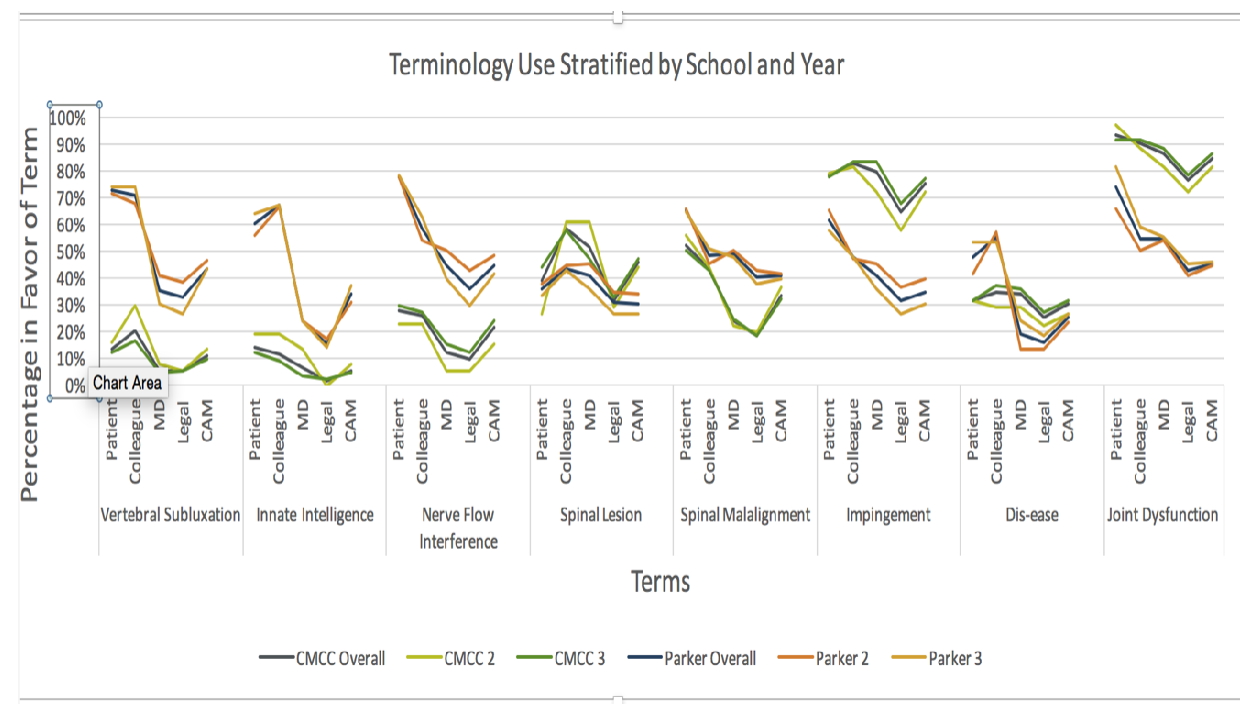


Figure 1.  
Comparison of students' responses to use of chiropractic terms with different groups of people.

#### Use of Chiropractic Terms (Table 4)

Students at Parker were more 'likely' or 'very likely' to use all the terms we considered as 'conservative' compared with CMCC students. Conversely, 'liberal' terms were found to be statistically significantly more commonly used by CMCC students, except for *spinal lesion*, which was used only slightly higher than Parker students (48.8% vs 40.7%, respectively). When the terms were reviewed by years, similar findings were found for the conservative terms. However, for the liberal terms the Year 2 students were found to have similar and not statistically significant differences (*impingement*: CMCC – 86.1% vs Parker – 67.6% and *joint dysfunction*: CMCC – 93.0% vs Parker – 77.7%).

#### Use of Chiropractic Lexicon with Different Groups of People

Figure 1 displays the chiropractic lexicon use with different groups of people for those students stating they would commonly use the term. Lexicon used from each institution does not overlap for five of the terms. Another find-

Table 4.

Comparison of percentages Year 2 and Year 3 students to 'likely' or 'very likely' use of chiropractic terms.

	CMCC	Parker	p-value
<b>Conservative Terms</b>			
vertebral subluxation	8.6%	86.3%	<0.001
innate intelligence	7.9%	68.3%	<0.001
dis-ease	30.7%	50.0%	<0.001
spinal misalignment	32.9%	73.0%	<0.001
nerve flow interference	19.3%	83.4%	<0.001
<b>Liberal Terms</b>			
spinal lesion	40.7%	48.8%	0.007
impingement	87.8%	59.1%	<0.001
joint dysfunction	93.6%	75.2%	<0.001



ing was the differences between years in the program and use of terms. There are noticeable dips in most response sets when it comes to using the terms in a *Legal Proceeding*, and to a lesser degree when measuring likelihood of term use with *Medical Doctors*.

## Discussion

This study found both similarities and differences in lexicon usage for chiropractic students at two different North American institutions. There were a few terms that had similarities by year of study, including ‘spinal lesion’, ‘impingement’, and ‘joint dysfunction’. All other terms were different with Parker students more in favor of using more ‘conservative’ terms compared with CMCC students, who tended to use more ‘liberal’ terms.

Both groups of students were in favor of the chiropractic culture authority to be wellness-based (CMCC: 47.2%; Parker: 59.7%) and neuromusculoskeletal focused (CMCC: 87.9%; Parker: 74.4%), but differed with respect to subluxation-based (CMCC: 9.3%; Parker: 56.3%) and musculoskeletal focus (CMCC: 64.4%; Parker: 33.6%). Caution needs to be taken, as the response rate was low for one of the CMCC groups.

As of 2005, two-thirds of US chiropractic programs were classified as ‘liberal’ and one-third as ‘conservative’.<sup>2</sup> Although CMCC was not specifically categorized in this report, according to these definitions CMCC would be in the ‘liberal’ category. Responses from Parker in our study were more mixed, suggesting that Parker students are exposed to both ‘liberal’ and ‘conservative’ concepts simultaneously. This differs from the 2005 placement of Parker as a strictly ‘conservative’ school.

CMCC teaches ‘conservative’ chiropractic concepts (i.e., the Palmer Postulates) from a historical perspective and focus more on ‘liberal’ concepts (PI personal communication). Parker, however, teaches both ‘conservative’ and ‘liberal’ concepts as part of their core curriculum (ER personal communication). Therefore, of the terms surveyed, ‘innate intelligence’, ‘vertebral subluxation’, and ‘dis-ease’ are found in the core curriculum of Parker to a greater extent as compared to CMCC. However, not all terms surveyed, such as ‘nerve flow interference’, are currently taught at Parker as part of core curriculum, but still had high usage. This could reflect co-curricular influence on students’ chiropractic lexicon usage or pre-professional identity.<sup>19</sup> It may also reflect findings similar to Puhl *et*

*al.*<sup>20</sup>, which found that there are significant differences in the number of ‘liberal’ and ‘conservative’ chiropractors that graduate from different chiropractic institutes.

Innes *et al.*<sup>9</sup> sought to find out how frequent ‘non-evidence-based beliefs’ are held in Australian chiropractic students. Of particular relevance to our study, Innes *et al.*<sup>11</sup> reported the vast majority of student respondents reported they would advise patients about ‘wellness’ in the future and when asked about the effects of spinal adjustments, the majority of Australian students responded that it helped “the body function at 100% of its capacity”. Roughly half of CMCC (46.4%) and Parker (59.7%) students in our study reported that chiropractic’s role in the healthcare delivery system was ‘wellness-based’, which is consistent with Innes *et al.*’s Australian cohorts.<sup>9</sup>

Our study reflected that Parker had similar results as the Gliedt *et al.*<sup>8</sup> and de Luca *et al.*<sup>21</sup> findings of both ‘conservative’ and ‘liberal’ beliefs / lexicon usage amongst the students surveyed. CMCC students, however, were found to have a more ‘liberal’ lexicon usage. These findings are also consistent with the McGregor *et al.*<sup>22</sup> study that surveyed 503 Canadian chiropractors (63% were CMCC graduates) that found the majority of respondents held mostly ‘liberal’ viewpoints. By contrast the McDonald *et al.*<sup>7</sup> survey of North American chiropractors reported most had a more mixed viewpoint similar to Parker students.

Mirtz and Perle<sup>23</sup> sought to determine the prevalence of the word ‘subluxation’ within North American chiropractic programs curricula. They reported that term subluxation was found in all but two American chiropractic programs and not in the curriculum of CMCC, although Budgett<sup>24</sup> investigated the use of the word subluxation at CMCC in more detail, reporting the term is used in a limited manner. According to Mirtz and Perle<sup>23</sup>, Palmer College (Florida) had the most prevalent use of the term subluxation (22% of courses) whereas 8% of courses at Parker University used that term.

Worldwide, Funk *et al.*<sup>25</sup> found the use of term subluxation was much more varied across chiropractic programs, but still highest among those in the United States. A number of authors have suggested this variation in the chiropractic lexicon, especially with respect to term subluxation, may impede both intraprofessional and interprofessional communications.<sup>2, 15, 17, 25-27</sup> That is, chiropractors from different chiropractic programs may

find it difficult to find a common lexicon to share ideas and perceptions, especially since operational definition of terms such as subluxation are so varied.<sup>28</sup> Some authors go even further, opining chiropractic's cultural authority can only be achieved by jettisoning conservative chiropractic terms, particularly the word subluxation.<sup>15,25-27</sup>

That said, we continue to be mindful of the findings by Biggs *et al.*<sup>11</sup> that reported that, in a survey conducted of Canadian chiropractors, 14.9% were found to be 'rationalists' (chiropractors who adopt scientific validation and champion a narrow scope of practice), 26.4% were found to be 'empiricists' (chiropractors who adopted the Palmer postulates, including subluxation theory) and the vast majority – over 56% – were 'moderates', sitting somewhere in-between these two groups. We opine that the findings of that study, along with the study by Gliedt *et al.*<sup>8</sup> may better reflect the attitudes of the majority of chiropractors who may exist on a continuum between liberal and conservative perspectives.

### Limitations

This study had several limitations. There was a relatively low and unequal response rate among students from both chiropractic programs, but especially noted for Year 2 of the CMCC program, which may have skewed our results because of non-response bias. This response rate may have been caused by the different distribution mechanism used at each institution, which should be carefully reviewed in future evaluations. Additionally, since the psychometric properties of the survey were not assessed we cannot be certain we measured what we intended to measure.

The options used to define the profession's cultural authority, the role of chiropractic in the healthcare delivery and the eight terms thought to be unique to chiropractic were generated by consensus opinion in an early study.<sup>10</sup> Since this was a somewhat unilateral and informal decision-making process it is possible some options and terms that should have been provided were not. Alternatively, since definitions of all terms and options were not included in the survey's instruction they may have been misunderstood by the respondents.

### Conclusions

We found that while there were some similarities, there were several statistically significant differences between

two North American chiropractic teaching institutions with respect to their perception of the profession's cultural authority, role in healthcare and likelihood to use various terms unique to the chiropractic lexicon. The influencers of these differences were not reviewed, but adds to the emerging need in the literature to evaluate the impact of curriculum and co-curriculum within chiropractic training programs on professional identity. Future studies ought to address the limitations identified and be conducted at other chiropractic programs longitudinally with a curriculum / co-curriculum assessment.

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