

## **Appendix H**

### **2014 Graduate Social Climate Survey**

#### **Structural Equation Model Summary**

Based on our own theoretical considerations as well as the results of an exploratory factor analysis indicating that a six-factor structure was appropriate, six factors were created using items from the 2014 Graduate Social Climate survey. These factors were: Derogatory Faculty Comments, Derogatory Student Comments, Program Climate, Program Support, Program Character, and Sense of Belonging; see Table 1 for factors and corresponding survey items. All items loaded significantly on their respective factors in all models presented; see Table 2 for standardized factor loadings for each model.

#### **Derogatory Faculty Comments and Derogatory Student Comments**

Participants in the survey responded to the question: “During the current semester, have you witnessed another graduate student or a faculty member in your graduate program make derogatory or insulting comments about people in the following social identity groups?” for thirteen different groups. Response options were 1 for “No”, 2 for “Yes, once”, and 3 for “Yes, more than once”, and participants responded to each item twice: separately for comments made by graduate students and by faculty members. Responses to the items assessing prevalence of derogatory comments by faculty members and graduate students toward racial or ethnic minorities, women, gay, lesbian, or bisexual people, people from countries other than the US, and non-native English speakers were used to make up the Derogatory Faculty Comments factor and the Derogatory Student Comments factor, respectively.

#### **Program Climate**

Six items assessing the social and intellectual climate of participants’ graduate program comprised the Program Climate factor. An example item was “Overall, the intellectual climate of my graduate program is positive.”

#### **Program Support**

The Program Support factor was composed of five items that reflected students’ perceptions of the supportiveness of their program with respect to practical concerns or professional development. An example item was “My department and/or advisor provides necessary support for me to graduate in a timely manner.”

#### **Program Character**

Six items reflecting the character of participants’ program with respect to social identity-relevant variables made up the Program Character factor. An example item was “My graduate program is not racist”.

#### **Sense of Belonging**

The Sense of Belonging factor was composed of four items that assessed students’ perceptions of feeling welcome, valued, and respected at the university and in their program. An example item was “During the current semester, have you felt valued in your graduate program?”.

Structural equation models were run using these six factors to predict students' responses to the item "If you were to start your graduate career again, would you select this same university?". In the general structure of the model, Derogatory Faculty Comments and Derogatory Student Comments were used to predict Program Character, and Program Climate and Program Support were used to predict Sense of Belonging. Program Support and Sense of Belonging were then used to predict the outcome variable (students' reported likelihood of choosing CU again). All covariances between factors were allowed to be free (see Table 3 for a listing of these covariances). In addition, two indicator variables were also used to predict the outcome—whether or not students reported having experienced hostile treatment while at CU Boulder ("hostile treatment" was defined as "behavior that is offensive, intimidating, or hostile and sufficiently serious to interfere with the ability to work or learn"), and a variable we termed "Failed Expectations". The Failed Expectations variable was constructed by summing the number of "No" responses that each participant had to a set of six items assessing whether they had received accurate information about the availability of funding in fall, spring, and summer, the amount of student fees, the provision of annual evaluations, the availability of training in teaching, and the availability of guidance in preparing work for publication. This general model<sup>1</sup> was run using maximum likelihood estimation four separate times: once for female master's and PhD students, once for male master's and PhD students, once for all master's students, and once for all PhD students. All regression paths are reported in standardized coefficients.

### **Model 1: Female Master's and Doctoral Students**

The model showed adequate fit when tested with female master's and PhD survey respondents (Chi-square (500) = 1973.38,  $p < .001$ , CFI = 0.895, RMSEA = 0.063). Both Program Support ( $B = 0.359$ ,  $p < .001$ ) and Program Climate ( $B = 0.581$ ,  $p < .001$ ) were significantly positively related to Sense of Belonging. Similarly, both Derogatory Student Comments ( $B = -0.361$ ,  $p < .001$ ) and Derogatory Faculty Comments ( $B = -0.354$ ,  $p < .001$ ) were significantly negatively related to Program Character. In turn, Sense of Belonging ( $B = 0.520$ ,  $p < .001$ ) and Program Character ( $B = 0.174$ ,  $p < .001$ ) were both significantly positively related to the outcome variable of likelihood of choosing CU again. Whether or not a woman reported experiencing hostile treatment was not significantly related to her likelihood of choosing CU again ( $B = -0.01$ ,  $p = .775$ ), but there was a significant relationship between Failed Expectations and the outcome variable ( $B = -0.087$ ,  $p = .011$ ) such that a higher number of failed expectations was related to lower reported likelihood of choosing CU again.

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<sup>1</sup> Based on methodological similarity, error covariances were allowed to be estimated for twelve pairs of items: intellectual climate and social climate (in the Program Climate factor), accommodating of disabilities and accepting of national origins, accommodating of disabilities and not transphobic, not transphobic and accepting of national origins, not homophobic and not transphobic, not racist and not sexist (in the Program Character factor), faculty derogatory GLB comments and student derogatory GLB comments, faculty derogatory comments about those from other countries and student derogatory comments about those from other countries, travel support and author credit (in the Program Support factor), and welcome at CU and welcome in program (in the Sense of Belonging factor).

### **Model 2: Male Master's and Doctoral Students**

The model showed adequate fit when tested with male master's and PhD respondents (Chi-square (500) = 1897.909,  $p < .001$ , CFI = 0.904, RMSEA = 0.057). As in Model 1, Program Support ( $B = 0.339$ ,  $p < .001$ ) and Program Climate ( $B = 0.554$ ,  $p < .001$ ) were significantly positively related to Sense of Belonging. Derogatory Student Comments ( $B = -0.299$ ,  $p < .001$ ) and Derogatory Faculty Comments ( $B = -0.239$ ,  $p < .001$ ) were both significantly negatively related to Program Character. Sense of Belonging ( $B = 0.527$ ,  $p < .001$ ) and Program Character ( $B = 0.134$ ,  $p = .001$ ) subsequently also predicted the outcome variable. Unlike in Model 1, whether or not a man reported experiencing hostile treatment was significantly related to a lower reported likelihood of choosing CU again ( $B = -0.092$ ,  $p = .007$ ). However, the relationship between Failed Expectations and the outcome variable was not significant in Model 2 ( $B = -0.045$ ,  $p = .176$ ).

### **Model 3: Master's Students**

The model showed adequate fit when tested with only master's students (Chi-square (500) = 1724.762,  $p < .001$ , CFI = 0.882, RMSEA = 0.062). As in the previous two models, Program Support ( $B = 0.341$ ,  $p < .001$ ) and Program Climate ( $B = 0.535$ ,  $p < .001$ ) significantly positively predicted Sense of Belonging. Again, Derogatory Student Comments ( $B = -0.442$ ,  $p < .001$ ) and Derogatory Faculty Comments ( $B = -0.116$ ,  $p = .046$ ) were significantly negatively related to Program Character. Sense of Belonging ( $B = 0.481$ ,  $p < .001$ ) and Program Character ( $B = 0.184$ ,  $p < .001$ ) once again were significantly positively related to likelihood of choosing CU again. There was no significant relationship between reported hostile treatment and the outcome variable ( $B = -0.011$ ,  $p = .786$ ), but there was a significant negative relationship between Failed Expectations and likelihood of choosing CU again ( $B = -0.098$ ,  $p = .012$ ).

### **Model 4: Doctoral Students**

The model showed adequate fit (Chi-square (500) = 2138.311,  $p < .001$ , CFI = 0.907, RMSEA = 0.058). As in Models 1, 2, and 3, Program Support ( $B = 0.339$ ,  $p < .001$ ) and Program Climate ( $B = 0.600$ ,  $p < .001$ ) were significantly positively related to Sense of Belonging. Derogatory Student Comments ( $B = -0.273$ ,  $p < .001$ ) and Derogatory Faculty Comments ( $B = -0.384$ ,  $p < .001$ ) once again negatively predicted Program Character. In turn, Sense of Belonging ( $B = 0.553$ ,  $p < .001$ ) and Program Character ( $B = 0.127$ ,  $p < .001$ ) subsequently positively predicted reported likelihood of choosing CU again. There was a marginal negative relationship between reported hostile treatment and the outcome variable ( $B = -0.058$ ,  $p = 0.064$ ), but no significant relationship between Failed Expectations and likelihood of choosing CU again ( $B = -0.036$ ,  $p = .239$ ).

In sum, a largely consistent pattern of relationships is seen across the four models. Students who report being supported by their program in terms of practical professional development and who report a positive program climate also report a greater sense of belonging. Students who have heard other graduate students and faculty make derogatory comments about social groups report a more negative characterization of their graduate program. Students with a greater sense of belonging and who report a more positive characterization of their program are more likely to say that they would choose CU again if they had to start their graduate career over. When looking across type of degree (master's and PhD), men who experience hostile treatment

report a lower likelihood of choosing CU again, while this relationship is not significant for women. Finally, again looking across degree type, women who report a greater number of failed expectations (in terms of not receiving accurate information about practical concerns such as funding and teaching training) report a lower likelihood of choosing of CU again. However, this relationship is not significant for men.

**Table 1. Structural Equation Model Factors and Corresponding Survey Items**

Factor	Items
Derogatory Faculty Comments	<p>During the current semester, have you witnessed faculty members make derogatory comments about (% answering “yes”):</p> <ul style="list-style-type: none"> <li>• Race/ethnicity</li> <li>• Women</li> <li>• Gay, lesbian, or bisexual people</li> <li>• People from another country</li> <li>• Non-English speakers</li> </ul>
Derogatory Student Comments	<p>During the current semester, have you witnessed other graduate students in my program make derogatory comments about (% answering “yes”):</p> <ul style="list-style-type: none"> <li>• Race/ethnicity</li> <li>• Women</li> <li>• Gay, lesbian, or bisexual people</li> <li>• People from another country</li> <li>• Non-English speakers</li> </ul>
Program Character	<p>Rate your graduate program on the following characteristics:</p> <ul style="list-style-type: none"> <li>• Racist (1) /not racist (6)</li> <li>• Sexist (1) /not sexist (6)</li> <li>• Homophobic (1) /not homophobic (6)</li> <li>• not accepting (1) /accepting of trans people (6)</li> <li>• not accepting (1) /accepting of diverse national origins (6)</li> <li>• not accommodating (1) /accommodating of people with disabilities (6)</li> </ul>
Program Climate	<p>(1=strongly disagree, 6=strongly agree)</p> <ul style="list-style-type: none"> <li>• Overall, the intellectual climate of my graduate program is positive</li> <li>• Overall, the social climate of my graduate program is positive</li> <li>• Students in my graduate program are treated with respect by faculty</li> <li>• Faculty members in my program demonstrate respect for others in the program through personal actions and behavior</li> <li>• Faculty members in my program create a supportive working and learning environment for graduate students</li> <li>• Faculty members in my program treat students fairly</li> </ul>
Program Support	<p>(1=strongly disagree, 6=strongly agree)</p> <ul style="list-style-type: none"> <li>• My department provides me with the necessary support to graduate in a timely manner</li> <li>• My department provides travel support to attend/present at conferences</li> <li>• There is someone I can speak to if I have a conflict with my advisor</li> <li>• In articles/conference papers, I receive appropriate recognition for my work</li> <li>• Faculty encourage my professional development</li> </ul>
Sense of Belonging	<p>(1=strongly disagree, 6=strongly agree)</p> <ul style="list-style-type: none"> <li>• I feel welcome at CU Boulder (like I belong here)</li> <li>• I feel welcome in my graduate program (like I belong there)</li> <li>• I feel valued in my graduate program</li> <li>• I am a respected member of my graduate program</li> </ul>

**Table 2. Standardized Factor Loadings for Models 1-4.**

Factor	Item	Model 1	Model 2	Model 3	Model 4
Derogatory Faculty Comments	Racial/ethnic minorities	0.618	0.758	0.686	0.659
	Women	0.662	0.739	0.449	0.733
	GLB	0.533	0.658	0.611	0.606
	People from other countries	0.818	0.775	0.88	0.779
	Non-native English speakers	0.856	0.825	0.896	0.833
Derogatory Student Comments	Racial/ethnic minorities	0.72	0.758	0.756	0.738
	Women	0.731	0.704	0.695	0.719
	GLB	0.625	0.712	0.761	0.615
	People from other countries	0.842	0.764	0.808	0.799
	Non-native English speakers	0.79	0.742	0.81	0.745
Program Climate	Positive intellectual climate	0.747	0.749	0.721	0.756
	Positive social climate	0.72	0.719	0.646	0.748
	Faculty respect students	0.926	0.908	0.885	0.927
	Faculty demonstrate respect for others	0.857	0.827	0.767	0.867
	Faculty create a supportive environment	0.937	0.924	0.901	0.94
Program Support	Faculty treat students fairly	0.866	0.823	0.809	0.852
	Graduate on time	0.802	0.848	0.816	0.825
	Travel support	0.406	0.396	0.494	0.374
	Support if there is advisor conflict	0.673	0.699	0.687	0.682
	Author credit/order	0.564	0.607	0.715	0.554
Program Character	Professional development	0.757	0.704	0.738	0.73
	Accepting of diverse national origins	0.734	0.728	0.691	0.744
	Accommodating of people with disabilities	0.722	0.674	0.687	0.705
	Not homophobic	0.828	0.781	0.785	0.823
	Not racist	0.821	0.778	0.77	0.822
Sense of Belonging	Not transphobic	0.746	0.786	0.675	0.79
	Not sexist	0.752	0.659	0.685	0.716
	Welcome at CU	0.607	0.656	0.664	0.614
	Welcome in program	0.86	0.822	0.849	0.836
	Valued in program	0.9	0.905	0.886	0.912
	Respected in program	0.854	0.836	0.821	0.858

Note: All loadings are significant at  $p < .001$ . All loadings are standardized.

**Table 3. Factor Intercorrelations for Models 1-4.**

<b>Correlation</b>	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>	<b>Model 4</b>
Derogatory Faculty Comments ~ Derogatory Student Comments	0.554	0.62	0.51	0.64
Derogatory Faculty Comments ~ Program Support	-0.223	-0.245	-0.178	-0.259
Derogatory Faculty Comments ~ Program Climate	-0.498	-0.297	-0.277	-0.437
Derogatory Student Comments ~ Program Support	-0.209	-0.195	-0.208	-0.202
Derogatory Student Comments ~ Program Climate	-0.345	-0.244	-0.287	-0.312
Program Support ~ Program Climate	0.625	0.677	0.655	0.668

Note: All correlations are significant at  $p < .001$ .