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## Modeling the mental health service utilization decisions of university undergraduates: A discrete choice conjoint experiment

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### ABSTRACT

**Objective:** We modeled design factors influencing the intent to use a university mental health service. **Participants:** Between November 2012 and October 2014, 909 undergraduates participated. **Method:** Using a discrete choice experiment, participants chose between hypothetical campus mental health services. **Results:** Latent class analysis identified three segments. A Psychological/Psychiatric Service segment (45.5%) was most likely to contact campus health services delivered by psychologists or psychiatrists. An Alternative Service segment (39.3%) preferred to talk to peer-counselors who had experienced mental health problems. A Hesitant segment (15.2%) reported greater distress but seemed less intent on seeking help. They preferred services delivered by psychologists or psychiatrists. Simulations predicted that, rather than waiting for standard counseling, the Alternative Service segment would prefer immediate access to E-Mental health. The Usual Care and Hesitant segments would wait 6 months for standard counseling. **Conclusions:** E-Mental Health options could engage students who may not wait for standard services.

### ARTICLE HISTORY

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College students; discrete choice experiment; mental health; service utilization

The college years constitute a stressful period for many students. Students worry about their academic performance, the likelihood of succeeding, postgraduate plans, and financial difficulties.<sup>1</sup> They are concerned about their sleep, health, body image, and relationships with friends.<sup>1</sup> In addition to the stresses of emerging adulthood and university life, many students struggle with more serious mental health problems.<sup>2,3</sup> In a representative sample of 2,188 college students in the United States, nearly 50% met DSM-IV criteria for a psychiatric disorder within the last year.<sup>2</sup> Zivin and colleagues found that 60% of those students from a Midwestern US university who experienced mental health problems reported psychiatric difficulties 2 years later.<sup>3</sup>

As in the United States, a significant percentage of Canadian young adults pursue postsecondary education. With the young adult years marking a peak in the onset

of mental health problems, college campuses represent an optimal point at which to position mental health services.<sup>4</sup> Campus health services report an increase in requests for help with mental health problems.<sup>1,5,6</sup> Many students with mental health concerns, however, do not contact formal service providers.<sup>6–9</sup> Utilization has been linked to perceived need for help, familiarity with available services, doubts about the effectiveness of treatment, fear of disclosure, and a preference for solving one's own problems.<sup>4,7,10</sup>

Given evidence that many students with mental health problems do not use campus health services,<sup>2</sup> it is important to explore options that might engage those who do not use existing models.<sup>4</sup> Although an important body of research has identified demographic characteristics and attitudes associated with low utilization,<sup>4,7,11</sup> we know less about the features of campus mental health services that might influence help-seeking decisions.

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## The current study

The involvement of students should be a fundamental principle in efforts to develop campus mental health services.<sup>5</sup> The views and preferences of the students who might use mental health services are likely to differ from those of the professionals who influence the design of these services.<sup>12</sup> This study, therefore, used a discrete choice conjoint experiment (DCE) to model student preferences regarding the design of campus mental health services. With roots in marketing<sup>13</sup> and health economics,<sup>14</sup> DCEs are a method of choice in service preference research.<sup>15</sup>

Discrete choice conjoint experiments begin by identifying the attributes of a service that might motivate utilization.<sup>15</sup> The decision to contact a campus health service, for example, might be influenced by clinic locations, the background of service providers, or the treatments available. Each attribute has multiple levels. Campus health services, for instance, might provide psychotherapy, medication, or alternative services focusing on lifestyle factors such as diet or exercise. Experimental design software presents choices between hypothetical services composed of different attribute-level combinations (Figure 1). Analyses estimate each attribute's relative contribution to utilization decisions (importance), and strength of preference (utility) for the levels of each attribute. Like real-world health service decisions, DCEs invite participants to consider the value of options with potentially competing features. Convenient on-campus locations, for example, might reduce logistical burdens but limit utilization by students concerned about revealing service contacts.<sup>5</sup> The trade-offs inherent in complex multi-attribute choices elicit the decision-making heuristics which are likely to be operating when difficult mental health service choices are considered,<sup>16</sup> limit the

influence of self-presentation biases,<sup>17</sup> and prove to be better predictors of real-world choices than simple preference ratings.<sup>13</sup>

This study explored three research questions (RQs).

### **RQ 1: Are there segments of students who prefer different mental health services?**

Although differential utilization may reflect attitudes and demographics,<sup>4,7</sup> the decision to seek help is, in all probability, also influenced by individual differences in preferences regarding the design and delivery of campus health services. We used latent class analysis to group students into segments with similar service design preferences and explored the extent to which gender, psychological distress, and the intent to use mental health services were linked to segment membership.

### **RQ 2: What attributes of campus mental health services influence each segment's utilization decisions?**

We estimated the relative influence that 11 four-level service design attributes exerted on each segment's decision to contact hypothetical mental health services.

### **RQ 3: Would students use an E-mental health service?**

Campus health centers have been faced with an increase in requests for mental health services.<sup>6,18</sup> In the United States, increased demand for campus mental health services has contributed to long waiting lists, a reduction in service to students with less severe problems, the introduction of brief therapy

The screenshot displays a web-based interface for a discrete choice experiment. At the top, it states: "We are developing a service encouraging students experiencing mental health problems to get help quickly. If you were experiencing a mental health problem, which service would you be most likely to contact." Below this, three service options are presented side-by-side, each in a grey-bordered box with a radio button at the bottom.

Service 1	Service 2	Service 3
This service starts immediately	Students wait for one month for this service to start	Students wait for 3 months for this service to start
Students talk to a Peer Counselor	Students talk to a mental health nurse	Students talk to a psychologist or psychiatrist
Contact is via the internet	Contact is by phone	Contact is face-to-face
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

At the bottom of the interface, there is a "Next" button and a progress bar showing 0% completion.

**Figure 1.** A sample of the format used in the warm-up task, 17 choice tasks, and two hold-out tasks completed by each participant.

models, or referral to off-campus services.<sup>6,18</sup> Delivering components of a university's mental health service via the Internet might supplement existing services, decrease barriers that limit access, and reduce the stigma linked to treatment.<sup>19</sup> Although some students might prefer online services,<sup>20</sup> attrition during Internet interventions raises questions regarding the acceptability of these models.<sup>21</sup> Using simulations, we explored design attributes influencing the decision to use E-mental health services. Because wait times exert an important influence on service utilization decisions,<sup>22</sup> we simulated the proportion of students who might use an E-mental health option rather than waiting for more conventional in-person services.

## Method

### Participants

The Hamilton Integrated Research Ethics Board approved this project. Students were recruited via introductory psychology classes at a moderate-sized (30,000) Canadian university. To ensure anonymity, neither identifying information nor IP addresses were recorded. Participants received a laboratory credit and were assured they could withdraw from the study without penalty. Of 945 requesting a survey link, 924 consented electronically and 909 completed

the entire survey. Sample demographics are described in Table 1.

### Context of the study

Ontario reference data for a Canadian edition of the American College Health Association's (ACHA's) National College Health Assessment<sup>23</sup> suggests the pattern of mental health concerns in Ontario colleges and universities is comparable to those reported by students at US colleges and universities.<sup>18</sup> Consistent with an increasing number of American campus health services<sup>6</sup> and the recommendations of the ACHA,<sup>24</sup> undergraduates had access to an integrated student wellness center staffed by nurses, social workers, psychologists, family practitioners, and psychiatrists. Services included wellness education, group or individual counseling, pharmacological treatment, and crisis intervention with referrals for specialized assessment and treatment at a nearby academic health science center. Services were advertised through mental health awareness campaigns, university Internet sites, and course materials. Treatment was tracked via an integrated health record.

### Survey development and design

This study was conducted as one component of a program of research exploring factors influencing the help-seeking decisions of individuals with emerging mental health

**Table 1.** Demographics percentages for the usual care, alternative service, and hesitant segments.

	N	Total %	Latent class segment			$\chi^2$
			Psych	Alternate	Hesitant	
Sample size	909	100	414	357	138	
Percent of sample			45.5	39.3	15.2	
Age						1.6
16–20	840	92.4	45.5	38.9	15.6	
21 and above	69	7.6	46.4	43.5	10.1	
Sex						49.3 <sup>c</sup>
Male	222	24.4	46.8	25.2	27.9	
Female	685	75.4	45.1	43.9	10.9	
Transgender	2	0.2	50.0	0.0	50.0	
Birth country						4.6
Canada	648	71.3	46.1	40.3	13.6	
Other	261	28.7	44.1	36.8	19.2	
Language						3.6
English	648	71.3	44.3	41.2	14.5	
Other	261	28.7	48.7	34.5	16.9	
Education						3.0
1st year student	782	86.0	45.4	38.6	16.0	
2nd year and above	127	14.0	46.5	43.3	10.2	
Mental Health Service Use						11.5 <sup>a</sup>
Not using or looking	766	84.3	44.3	40.7	15.0	
Looking for services	84	9.2	46.4	40.5	13.1	
Using services	59	6.5	61.0	18.6	20.3	
Friend or family member						6.6
Not using or looking	595	65.5	44.0	39.8	16.1	
Looking for mental health service	69	7.6	37.7	43.5	18.8	
Using mental health service	245	27.0	51.4	36.7	11.8	

Note. <sup>a</sup> $p < 0.05$ , <sup>c</sup> $p < 0.001$ . Psych = Psychological/Psychiatric Service segment.

problems. We began by studying the decisions of those receiving mental health services. To inform the development of an integrated system of services and facilitate comparisons, we selected a set of attributes that influenced the utilization decisions of patients receiving mental health services (eg range of treatment options, wait times, background of service providers).<sup>22</sup> We modified these attributes for university settings and added content relevant to campus health services (eg outreach and advertising, telehealth, and E-mental health alternatives). To avoid bias (number of levels effect), each attribute had four levels.<sup>13</sup> A partial profile design presented choices composed of a subset of the study's attributes.<sup>25</sup> Sawtooth Software's experimental design algorithm<sup>25</sup> composed choice tasks presenting three options described by the levels of three attributes (Figure 1). Following consent, definitions of mental health problems, and a warm-up task, participants completed 17 choice tasks, two hold-out choice tasks (described below), demographic questions, five Likert (1 = strongly disagree, 2 = disagree, 3 = neither agree or disagree, 4 = agree, 5 = strongly agree) questions measuring the intent to use different face-to-face services (eg talk face-to-face to a mental health professional), and four items measuring the intent to pursue self-help options (eg read a book about mental health problems). Finally, students completed the K-6,<sup>26</sup> a measure of psychological distress that included six Likert items (eg "During the past 30 days how often did you feel nervous") scored from 0 (none of the time) to 4 (all of the time). Internal consistency (Cronbach's alpha) in this study was .85.

### Data analysis

Our approach to data analysis has been detailed previously.<sup>22,27</sup> We used latent class analysis (Latent Gold Choice 4.5) to address RQ1. Using maximum likelihood solutions, this finite-mixture model groups participants into classes with similar service preferences.<sup>28,29</sup> We specified models with one, two, three, four, and five classes.<sup>28,29</sup> To obtain a representative model, each solution was computed 10 times from different starts.<sup>28,29</sup> To improve fit and explanatory power,<sup>28,30,31</sup> four covariates were included: K-6 scores, gender (0 = male versus 1 = female), the intent to use face-to-face mental health services, and the intent to use self-help services. Each participant's posterior probability of class membership was used to determine most probable class assignment.<sup>29</sup> Nonparametric analyses explored links between demographics and class membership.

Latent Gold Choice 4.5 was also used to address RQ2. Using effects coded data, this approach integrates a conditional logit algorithm to compute standardized (zero-centered) parameter estimates (utility values) reflecting

each segment's preference for the levels of each attribute (RQ2). Utility values were converted to Z scores to determine whether estimates differed from zero (Table 2). For each segment, importance scores (Figure 2) were computed by dividing the range (high minus low) of each attribute's utility values by the summed utility value range of all 11 attributes.

To address RQ3, randomized first choice simulations<sup>13</sup> predicted the percentage of students who would contact a hypothetical E-mental health service versus Standard Counseling, a more conventional approach to treatment. As described below, we created these options by varying the levels of four attributes with others held constant.

Two identical hold-out choice tasks were removed from the data set prior to utility estimation.<sup>13</sup> The mean absolute discrepancy between the predicted and observed percentage of participants selecting each hold-out task option was 5.5% for task 1 and 4.8% for task 2, mean absolute errors suggesting high predictive validity.

## Results

### RQ 1: Do segments of students prefer different mental health services?

A three-class model (Table S1) yielded the lowest Bayesian Information Criterion (BIC) and Adjusted BIC values. This solution proved interpretable and administratively relevant.<sup>29,32</sup> A bootstrap  $-2$  log-likelihood difference test confirmed that three classes yielded a significantly better fit than a two-class model (431.773,  $p < .001$ ).

### RQ 2: What attributes of campus mental health services influence each segment's utilization decisions?

#### Psychological/psychiatric service (45.5%)

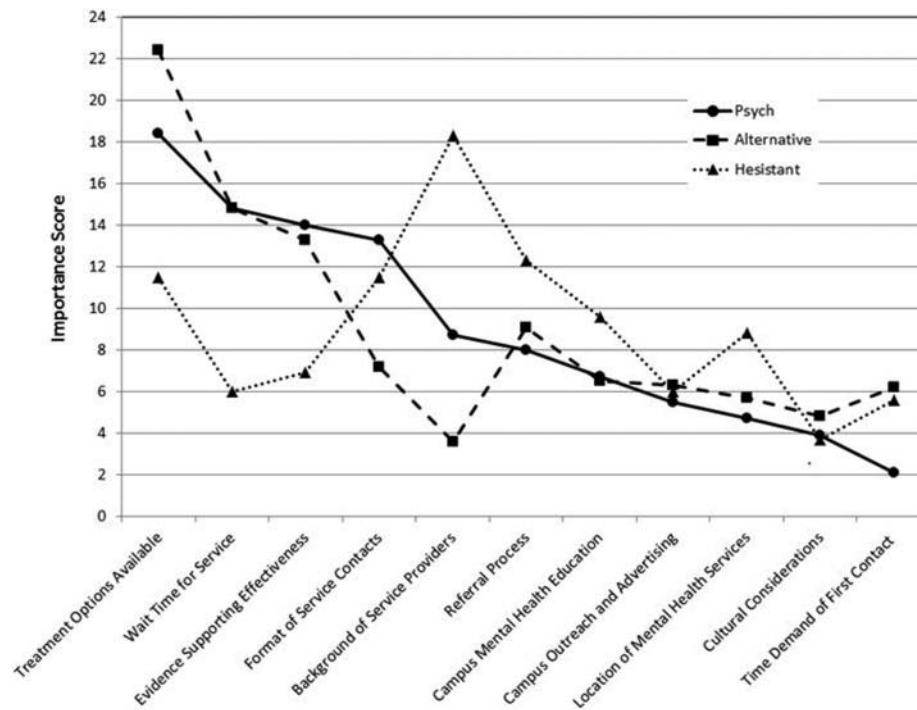
Importance scores show that variations in the background of service providers exerted a strong influence on the mental health service students were most likely to contact (Figure 2). Because utility coefficients show that this segment was most likely to contact a program where they could talk to psychologists or psychiatrists, we labeled this a Psychological/Psychiatric Service segment. Importance scores (Figure 2) show that variation in the range of treatment options offered exerted a greater influence on this segment's choices than any other attribute. Utility coefficients (Table 2) show they preferred a choice of alternative services, psychotherapy, or medication. They were most likely to contact services allowing self-referral. Wait times exerted an important influence on this segment's choices (Figure 2). They were most likely to contact a service providing immediate access (Table 2). They showed a strong

**Table 2.** Zero-centered utility coefficients and Z values for usual care, alternative service, and hesitant segments.

Attribute Content of attribute levels	Segment						Wald
	Psych		Alternative		Hesitant		
	U	Z	U	Z	U	Z	
Treatment options available (provides ...)							233.63 <sup>c</sup>
Only alternative treatments (eg diet, exercise)	-0.04	-0.48	0.58	7.68	-0.22	-2.28	
Only psychotherapy	-0.17	-2.57	-0.53	-6.17	0.15	1.66	
Only medications	-1.35	-12.65	-1.60	-12.58	-0.21	-2.17	
Choice of alternative treatments (eg diet, exercise), psychotherapy & med	<b>1.56</b>	<b>21.25</b>	<b>1.55</b>	<b>19.55</b>	<b>0.29</b>	<b>3.12</b>	
Wait time for service							158.57 <sup>c</sup>
This service starts immediately	<b>1.27</b>	<b>16.64</b>	<b>1.03</b>	<b>14.42</b>	-0.01	-0.07	
Students wait for 1 month for this service to start	0.35	6.12	0.19	3.23	<b>0.11</b>	1.41	
Students wait for 3 months for this service to start	-0.54	-7.45	-0.16	-2.43	0.05	0.58	
Students wait for 6 months for this service to start	-1.08	-12.52	-1.06	-12.28	-0.16	-1.76	
Evidence supporting effectiveness							141.92 <sup>c</sup>
We do not know if this service is helpful	-1.47	-14.23	-1.00	-11.49	-0.16	-1.74	
Students who have experienced mental health problems say this service is helpful	<b>0.75</b>	<b>11.47</b>	<b>0.87</b>	<b>13.53</b>	-0.10	-1.06	
Mental health professionals say this service is helpful	0.59	9.19	0.12	1.90	<b>0.14</b>	1.63	
Research says this service is helpful	0.12	1.86	0.01	0.11	0.13	1.42	
Format of service contacts							227.30 <sup>c</sup>
Contact is via the Internet	-1.17	-12.09	0.04	0.57	-0.20	-1.98	
Contact is by phone	-0.70	-9.30	-0.39	-5.53	-0.22	-2.46	
Contact is face-to-face	<b>0.94</b>	<b>13.10</b>	-0.29	-3.22	<b>0.29</b>	<b>3.10</b>	
Students select contact by phone, Internet, or face-to-face	0.93	14.25	<b>0.63</b>	10.10	0.13	1.45	
Background of service providers							65.60 <sup>c</sup>
Students talk to a Peer Counselor	-0.68	-8.99	-0.23	-3.62	-0.21	-2.36	
Students talk to a Peer Counselor who has experienced mental health problems	-0.15	-2.30	<b>0.28</b>	4.36	-0.28	-2.67	
Students talk to a mental health nurse	0.13	2.14	-0.10	-1.45	-0.04	-0.39	
Students talk to a psychologist or psychiatrist	<b>0.69</b>	<b>10.48</b>	0.05	0.77	<b>0.53</b>	<b>6.10</b>	
Referral process							71.09 <sup>c</sup>
Students can refer themselves	<b>0.73</b>	<b>11.40</b>	<b>0.78</b>	<b>12.37</b>	0.27	2.92	
Students must be referred by a family doctor	0.15	2.07	-0.38	-5.38	<b>0.28</b>	<b>3.14</b>	
Students must be referred by a telehealth nurse	-0.34	-5.03	-0.51	-7.13	-0.27	-2.89	
Students must be referred by an Internet screening service	-0.53	-6.75	0.10	1.59	-0.28	-2.86	
Campus mental health education							21.33 <sup>b</sup>
This service does not educate the campus about mental health	-0.64	-9.22	-0.62	-8.28	-0.17	-1.85	
Once a year this service educates the campus about mental health	-0.15	-2.46	0.00	0.01	-0.22	-2.31	
Once a month this service educates the campus about mental health	0.38	6.70	<b>0.31</b>	5.16	<b>0.21</b>	<b>2.46</b>	
Once a week this service educates the campus about mental health	<b>0.41</b>	<b>7.05</b>	0.31	4.97	0.18	2.20	
Campus outreach and advertising							50.45 <sup>c</sup>
This service is not advertised	-0.43	-6.21	-0.41	-6.01	<b>0.13</b>	1.51	
This service is advertised on campus radio	-0.27	-4.33	-0.31	-4.79	-0.13	-1.50	
This service is advertised at public awareness events on campus	<b>0.44</b>	<b>7.43</b>	0.24	3.80	0.00	-0.02	
This service is advertised on university Internet sites like Mac Connect	0.26	4.07	<b>0.48</b>	8.03	0.00	0.00	
Location of mental health services							42.85 <sup>c</sup>
This service is used at my residence	-0.17	-2.35	0.14	1.95	-0.28	-2.72	
This service is at a community walk in clinic	-0.30	-4.88	-0.11	-1.74	0.06	0.70	
This service is at a community hospital	0.03	0.49	-0.41	-5.53	<b>0.12</b>	1.36	
This service is at a campus student health center	<b>0.44</b>	<b>7.00</b>	<b>0.39</b>	<b>6.05</b>	0.10	1.08	
Cultural considerations (when assigning service providers)							23.20 <sup>c</sup>
Language, ethnicity, and religion are not considered when assigning clinicians	-0.34	-4.74	-0.25	-3.40	0.00	-0.05	
The service decides if language, ethnicity, and religion are considered assigning clinicians	0.03	0.50	-0.25	-3.88	-0.10	-1.15	
Students decide if language, ethnicity, and religion are considered when assigning clinicians	<b>0.28</b>	<b>4.65</b>	<b>0.42</b>	<b>7.03</b>	0.03	0.37	
Language, ethnicity, and religion are always considered when assigning clinicians	0.04	0.61	0.08	1.34	<b>0.07</b>	<b>0.78</b>	
Time demand of first contact							23.69 <sup>c</sup>
First contact takes 1 hour	<b>0.21</b>	<b>3.25</b>	<b>0.43</b>	<b>7.00</b>	<b>0.12</b>	<b>1.42</b>	
First contact takes 2 hours	0.01	0.15	0.24	4.17	0.03	0.40	
First contact takes 3 hours	-0.09	-1.41	-0.23	-3.46	-0.03	-0.34	
First contact takes 4 hours	-0.13	-2.08	-0.44	-6.46	-0.13	-1.44	

Note. U = parameter estimates expressed as zero-centered utility coefficients. Psych = Psychological/Psychiatric Service Attributes are organized in order of their importance to the Psychological/Psychiatric Service segment. Higher utility coefficients reflect a stronger preference. Within segments, the attribute level with the highest utility coefficient is bolded. Z = Z scores. Z scores greater than 1.96 differ from zero, the sum of the parameter estimates. Wald statistics determine whether differences among segments are significant.

<sup>b</sup>p < 0.01; <sup>c</sup>p < 0.001.



**Figure 2.** Relative importance of campus mental health service attributes. Attributes are ordered according to their relative importance to the Psychological/Psychiatric (Psych) Service segment. Attributes with higher importance scores exert a greater influence on the decision to contact a campus mental health service.

preference for a face-to-face service and a less favorable response to Internet options (Table 2). They preferred options recommended by students who had experienced mental health problems. They were most likely to contact a service that educated the campus about mental health once weekly, located mental health services on campus, and advertised services at campus awareness events. Although participants preferred that students decide whether culture and religion were considered when assigning clinicians (Table 2), these factors exerted little influence on this segment's choices (Figure 2). Covariate analyses showed that membership in the Psychological/Psychiatric Service segment was linked to lower K-6 scores ( $\mu = -0.04$ ,  $se = 0.01$ ,  $Z = -2.59$ ), a higher score on the intent to use face-to-face mental health services scale ( $\mu = 0.17$ ,  $se = 0.03$ ,  $Z = 5.95$ ), and lower scores on the intent to use self-help services scale ( $\mu = -0.16$ ,  $se = 0.03$ ,  $Z = -5.72$ ).

#### **Alternative service (39.3%)**

This segment preferred a choice of treatments (Table 2). When considering the individual options, however, they were most likely to choose services providing alternatives such as diet and exercise rather than psychotherapy or medication. They were, therefore, labeled an Alternative Service segment. They preferred talking to peer counselors

who had experienced mental health problems. This segment was sensitive to the source of evidence supporting the benefits of mental health services (Figure 2); they preferred services recommended by students who had experienced mental health problems (Table 2). Although they preferred a choice of face-to-face, telephone, or Internet contact, they favored an Internet format. They preferred services located at a campus student health center, advertised via university Internet sites, and supported by a monthly on-campus campaign educating students about mental health (Table 2). Like the Psychological/Psychiatric Service segment, they were sensitive to increases in wait times (Figure 2). Membership in the Alternative Service segment was associated with lower K-6 scores ( $\mu = -0.03$ ,  $se = 0.02$ ,  $Z = -2.08$ ), a lower intent to use face-to-face service ( $\mu = -0.10$ ,  $se = 0.03$ ,  $Z = -3.62$ ), but a higher intent to use self-help options ( $\mu = 0.21$ ,  $se = 0.03$ ,  $Z = 6.19$ ). Women were more likely to be members of this segment ( $\mu = 0.35$ ,  $se = 0.09$ ,  $Z = 3.95$ ).

#### **Hesitant (15.2%)**

Membership in this segment was associated with higher K-6 scores, ( $\mu = 0.07$ ,  $se = 0.02$ ,  $Z = 4.26$ ) but a lower intent to use face-to-face mental health services ( $\mu = -0.07$ ,  $se = 0.03$ ,  $Z = -2.55$ ). On a single Likert question, this segment indicated they would be less likely (36.2%)

than the Psychological/Psychiatric (59.4%) or Alternative Service (44.3%) segments to use a campus mental health service if they were experiencing mental health problems,  $X^2 (N = 909) = 29.87, p < .001$ . They were, therefore, labeled a Hesitant segment. Wait times exerted relatively little influence on this segment's choices (Figure 2). Indeed, they tended to prefer a 1-month delay in the start of treatment. This segment was more sensitive to the professional background of service providers than to any other attribute (Figure 2). They preferred referral by a family doctor to a face-to-face service with an opportunity to talk to psychologists or psychiatrists (Table 2). They valued a choice of treatment options but tended to favor psychotherapy rather than alternative treatments or medication. Men were more likely to be members of this segment ( $\mu = 0.43, se = 0.08, Z = 5.13$ ).

### RQ 3: Would students use an E-mental health service?

The results of Simulation 1 are summarized in Table 3. The Standard Counseling option (1) was advertised at special events on campus, (2) allowed students to refer themselves, (3) provided face-to-face service, (4) and provided the opportunity to talk to a psychologist or psychiatrist. The E-mental health option (1) was advertised on university Internet sites, (2) provided access via an Internet screening and referral service, (3) was delivered via the Internet, and (4) included an opportunity to talk with a peer counselor. Simulations predicted that, with

no wait for either option, 89.5% of students would choose Standard Counseling. The predicted likelihood of using the E-mental health option was lowest (0.5%) in the Psychological/Psychiatric service segment and highest (20.8%) in the Alternative Service segment.

Simulation 2 through 4 (Table 3) varied the start of Standard Counseling from no wait, to waits of 1, 3, and 6 months. As wait times for Standard Counseling increased, predicted E-mental health utilization increased from 0.5% to 13.1% of the Psychological/Psychiatric Service segment, 20.8% to 65.6% of the Alternative Service segment, and 13.8% to 21.4% of the Hesitant segment.

### Comment

US studies suggest that many students with psychological difficulties do not contact campus health services.<sup>4,7-9</sup> Only 50% of the students in the current study indicated that, if they were experiencing mental health problems, they would seek help from a campus mental health service. Our results suggest a more differentiated range of service options would engage a greater proportion of these students. Providing student-centered service is a core value of the ACHA; this study illustrates the use of an approach derived from marketing<sup>13</sup> and health economics<sup>14</sup> to engage students in the service design process.<sup>5</sup> Latent class analysis identified a segment of students that would use an E-mental health option reducing wait times. Below we highlight factors influencing the design preferences of each segment of students,

**Table 3.** Randomized first choice simulations.

	Segment							
	Total		Psych		Alternative		Hesitant	
	%	SE	%	SE	%	SE	%	SE
Simulation 1								
E-mental health: no wait	10.5	(0.8)	0.5	(0.2)	20.8	(1.7)	13.8	(2.2)
Standard counseling: no wait	89.5	(0.8)	99.5	(0.2)	79.2	(1.7)	86.2	(2.2)
Simulation 2								
E-mental health: no wait	17.7	(1.0)	2.0	(0.4)	36.3	(2.0)	16.7	(2.4)
Standard counseling: 1-month wait	82.3	(1.0)	98.0	(0.4)	63.7	(2.0)	83.3	(2.4)
Simulation 3								
E-mental health: no wait	24.0	(1.1)	5.8	(0.7)	47.5	(2.1)	18.0	(2.5)
Standard counseling: 3-month wait	76.0	(1.1)	94.2	(0.7)	52.5	(2.1)	82.0	(2.5)
Simulation 4								
E-mental health: no wait	34.9	(1.3)	13.1	(1.1)	65.5	(1.9)	21.4	(2.8)
Standard counseling: 6-month wait	65.1	(1.3)	87.0	(1.1)	34.5	(1.9)	78.6	(2.8)

Note. Psych = Psychology/Psychiatry Service segment; SE = standard error.



link our results to previous research, and consider the implications of our findings.

The Psychological/Psychiatric Service segment (45.5%) preferred a face-to-face service provided by psychologists or psychiatrists, was less intent on pursuing self-help options, and showed the least favorable response to E-mental health services. Simulations predicted that most students in this segment would wait 6 months for Standard Counseling rather than utilizing an immediately available E-mental health option.

The Alternative Service (39.3%) segment was most likely to contact services allowing them to talk to peer counselors who had experienced mental health problems. Although they valued a choice of treatments, they preferred services focusing on lifestyle factors such as diet and exercise rather than psychotherapy or medication. Simulations predicted 65.6% of the students in this segment would prefer E-mental health to a 6-month wait for Standard Counseling.

Although the Hesitant Segment (15.2%) reported greater psychological distress, they were less intent on using campus mental health services and preferred to delay the start of treatment. Like the Psychological/Psychiatric Service segment, they were more likely to contact services in which psychologists or psychiatrists provided face-to-face treatment. Simulations predicted 78.6% of this segment would wait 6 months for Standard Counseling rather than utilizing an immediately available E-mental health option.

### **Implications for campus mental health services**

#### **Use E-mental health options to reduce wait times**

In the absence of waiting lists, there was surprisingly little interest in E-mental health options (10.5% of the sample). Simulations, however, predicted that 65.6% of the Alternative Service segment (34.9% of the overall sample) would trade Standard Counseling with a 6-month wait time for an E-mental health option that started immediately. Research at the University of Washington demonstrates that the type of Internet models included in our simulations can be used to screen students for mental health problems.<sup>33</sup> Internet interventions have been shown to reduce anxiety and depression<sup>34,35</sup> and address substance abuse issues.<sup>36</sup> In addition to reducing wait times, E-mental health services might increase utilization by those fearing stigmatization by face-to-face services,<sup>4</sup> enhance screening,<sup>4,33</sup> and supplement conventional approaches to treatment. With 34.9% of the sample willing to consider this option, campus mental health services delivered via the Internet constitute an important area for future research.

#### **Mobilize the influence of peers who have experienced mental health problems**

The Psychological/Psychiatric Service and Alternative Service segments were more likely to contact a campus health service that students who had experienced mental health problems found helpful. The Alternative Service segment, moreover, preferred to talk to peer counselors who had experienced mental health problems rather than to psychologists, psychiatrists, or mental health nurses. They evidenced little interest in peer counselors without lived experience and were not influenced by research supporting the benefits of treatment. These results are consistent with evidence that students with mental health problems are more likely to seek help from informal sources such as peers, family members, or websites.<sup>4</sup> Although US campus mental health services have successfully trained students as gatekeepers who link their peers to mental health services,<sup>37</sup> there is little evidence regarding the use of campus-based peer counselors who have experienced mental health problems. Given their influence on the utilization decisions of peers, and promising but preliminary findings regarding their impact,<sup>38</sup> this question merits exploration.

#### **Support decision control**

Students were more likely to contact a service affording a choice of treatment options. The Psychological/Psychiatric Service and Alternative Service segments preferred to choose the format in which services were provided and, consistent with the ACHA's Cultural Competency Statement,<sup>39</sup> the extent to which language, ethnicity, and religion are considered when assigning service providers. Enabling choices is consistent with the ACHA's core value of promoting student-centered services and supported by systematic reviews showing that mental health services consistent with user preferences improve utilization, adherence, and outcome.<sup>40,41</sup>

#### **Develop alternative services**

A preference for alternative services such as diet and exercise, and the tendency to avoid medication, is consistent with previous research.<sup>12,20</sup> In a study of mental health information preferences, for example, emerging adults chose information about lifestyle changes rather than medication or psychological interventions.<sup>20</sup> Patients being treated for psychiatric problems, moreover, feel that individuals experiencing mental health problems would be more likely to seek help from an early intervention service that included alternative treatments.<sup>22</sup> Systematic reviews provide some support for lifestyle interventions such as aerobic exercise<sup>42</sup> and diet<sup>43</sup> as strategies for reducing anxiety and depression.

The extent to which students valued these approaches suggests that the inclusion of lifestyle interventions as components of prevention programs, adjuncts to evidence-based services, components in a stepped care model,<sup>44</sup> or alternatives to psychotherapy or medication, may increase the percentage of students willing to contact campus mental health services.

### Limitations

This study is limited by the use of a convenience sample recruited from introductory psychology classes. Although a significant proportion of university undergraduates enroll in this class, we cannot generalize our findings to all students. In comparison to the university at large (approximately 46% men), men were under represented in our sample (24% men). This is the only demographic factor linked to segment membership (Table 1). Covariate analysis confirmed that men were more likely to reside in the Hesitant segment. Increasing their representation in the sample, therefore, would increase the proportion of participants in the Hesitant segment. To estimate the potential influence of this sampling bias, we randomly reduced the number of women in the sample to approximate their percentage at the university (54%). Estimating a latent class model for this more representative sample, again, yielded a three-segment solution with a pattern of utility coefficients and importance scores replicating our original findings.

Second, although this survey was conducted at a moderate-sized Canadian university, several factors suggest the results are relevant to campuses in the United States. The pattern of mental health concerns in Ontario colleges and universities<sup>23</sup> is similar to those reported in the United States.<sup>18</sup> The campus health services available to students, moreover, are consistent with ACHA recommendations<sup>24,39</sup> and similar to those provided on US campuses.<sup>6</sup>

Third, the interpretation of DCEs could be limited by design attributes that were not included in our models.<sup>13</sup> Last, this study examined attributes influencing the decision to contact a campus mental health service; a different set of attributes may influence longer term engagement and adherence.

### Conclusion

This study suggests that engaging students with mental health problems requires a differentiated set of services ranging from psychotherapy to alternatives such as diet and exercise. Students valued decision control and the

perspective of peers who had experienced mental health problems. Simulations predicted that E-mental health services reducing wait times could engage a segment of students who may not wait for services delivered in a traditional format. Research on the utilization of E-mental health options and the contribution of peers with mental health problems may inform strategies for improving engagement in campus mental health services.

### Conflict of interest disclosure

The authors confirm that the research presented in this article met the ethical guidelines, including adherence to the legal requirements, of Canada and received approval from the Institutional Review Board of McMaster University, Faculty of Health Sciences. Dr. Cunningham receives salary support from BCFPI Inc. which provides child and youth mental health screening and outcome measurement systems. He receives royalties from workshops and materials for large group parent training programs.

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### References

1. Beiter R, Nash R, McCrady M, et al. The prevalence and correlates of depression, anxiety, and stress in a sample of college students. *J Affect Disord.* 2015;173:90–96.
2. Blanco C, Okuda M, Wright C, et al. Mental health of college students and their non-college-attending peers: Results from the national epidemiologic study on alcohol and related conditions. *Arch Gen Psychiatry.* 2008;65(12):1429–1437.
3. Zivin K, Eisenberg D, Gollust SE, Golberstein E. Persistence of mental health problems and needs in a college student population. *J Affect Disord.* 2009;117(3):180–185.
4. Eisenberg D, Hunt J, Speer N. Help seeking for mental health on college campuses: Review of evidence and next steps for research and practice. *Harv Rev Psychiatry* 2012;20(4):222–232.
5. Mowbray CT, Megivern D, Mandiberg JM, et al. Campus mental health services: Recommendations for change. *Am J Orthopsychiatry.* 2006;76:226–237.
6. Prince JP. University student counseling and mental health in the united states: Trends and challenges. *Mental Health Prev.* 2015;3(1):5–10.
7. Eisenberg D, Golberstein E, Gollust SE. Help-seeking and access to mental health care in a university student population. *Med Care.* 2007;45(7):594–601.

8. Hunt J, Eisenberg D. Mental health problems and help-seeking behavior among college students. *J Adolesc Health*. 2010;46(1):3–10.
9. Rosenthal B, Wilson WC. Mental health services: Use and disparity among diverse college students. *J Am Coll Health*. 2008;57(1):61–68.
10. Yorgason JB, Linville D, Zitzman B. Mental health among college students: Do those who need services know about and use them? *J Am Coll Health*. 2008;57(2):173–182.
11. Eisenberg D, Downs MF, Golberstein E, Zivin K. Stigma and help seeking for mental health among college students. *Med Care Res Rev*. 2009;66:522–541.
12. Jorm AF, Morgan AJ, Wright A. Interventions that are helpful for depression and anxiety in young people: A comparison of clinicians' beliefs with those of youth and their parents. *J Affect Disord*. 2008;111(2–3):227–234.
13. Orme BK. *Getting Started with Conjoint Analysis: Strategies for Product Design and Pricing Research*. 2nd ed. Madison, WI: Research Publishers; 2009.
14. de Bekker-Grob EW, Ryan M, Gerard K. Discrete choice experiments in health economics: A review of the literature. *Health Econ*. 2012;21(2):145–172.
15. Bridges JFP, Hauber AB, Marshall D, Lloyd A, Prosser LA, Regier DA, Johnson FR, Mauskopf J. Conjoint analysis applications in Health—a checklist: A report of the ISPOR good research practices for conjoint analysis task force. *Value Health*. 2011;14:403–413.
16. Evans JS. Dual-processing accounts of reasoning, judgment, and social cognition. *Annu Rev Psychol*. 2008;59:255–278.
17. Caruso EM, Rahnev DA, Banaji MR. Using conjoint analysis to detect discrimination: Revealing covert preferences from overt choices. *Soc Cognit*. 2009;27(1):128–137.
18. Gallagher RP. *National Survey of College Counseling*. Pittsburgh, PA: The International Association of Counseling Services, Inc. Spring, 2012.
19. Christensen H, Hickie IB. E-mental health: A new era in delivery of mental health services. *Med J Aust*. 2010;192(11):S2.
20. Cunningham CE, Walker JR, Eastwood JD, Westra H, Rimas H, Chen Y, Marcus M, Swinson RP, Bracken K, Mobilizing Minds Research Group. Modeling mental health information preferences during the early adult years: A discrete choice conjoint experiment. *J Health Commun*. 2014;19(4):413–440.
21. Melville KM, Casey LM, Kavanagh DJ. Dropout from internet-based treatment for psychological disorders. *Br J Clin Psychol*. 2010; 49:455–471.
22. Becker MP, Christensen BK, Cunningham CE, et al. Preferences for early intervention mental health services: A discrete-choice conjoint experiment. *Psychiatr Serv*. 2015: appips201400306.
23. American College Health Association. *American College Health Association-National College Health Assessment II: Ontario Canada Reference Group Executive Summary Spring 2016*. Hanover, MD: American College Health Association; 2016.
24. De Maria P, Readdean K, Drayton V. Considerations for integration of counseling and health services on college and university campuses. *J Am Coll Health*. 2010;58(6):583–596.
25. Johnson RF, Lancsar E, Marshall D, et al. Constructing experimental designs for discrete-choice experiments: Report of the ISPOR conjoint analysis experimental design good research practices task force. *Value Health*. 2013;16(1):3–13.
26. Kessler RC, Green JG, Gruber MJ, et al. Screening for serious mental illness in the general population with the K6 screening scale: Results from the WHO world mental health (WMH) survey initiative. *Int J Methods Psychiatr Res*. 2010;19(Suppl 1):4–22.
27. Cunningham CE, Chen Y, Deal K, et al. The interim service preferences of parents waiting for children's mental health treatment: A discrete choice conjoint experiment. *J Abnorm Child Psychol*. 2013;41(6):865–877.
28. Lanza ST, Rhoades BL. Latent class analysis: An alternative perspective on subgroup analysis in prevention and treatment. *Prev Sci*. 2013;14(2):157–168.
29. Berlin KS, Williams NA, Parra GR. An introduction to latent variable mixture modeling (part 1): Overview and cross-sectional latent class and latent profile analyses. *J Pediatr Psychol*. 2014;39(2):174–187.
30. Vermunt JK, Magidson J. *Technical Guide for Latent GOLD 4.0: Basic and Advanced*. Belmont, MA: Statistical Innovations Inc.; 2005.
31. Huang GH, Bandeen-Roche K. Building an identifiable latent class model with covariate effects on underlying and measured variables. *Psychometrika*. 2004;69(1):5–32.
32. Nylund K, Asparouhov T, Muthén BO. Deciding on the number of classes in latent class analysis and growth mixture modeling: A monte-carlo simulation study. *Struct Equ Model*. 2007;14(4):535–569.
33. Eung-Hun Kim, Coumar A, Lober WB, Yongmin Kim. Addressing mental health epidemic among university students via web-based, self-screening, and referral system: A preliminary study. *IEEE Trans Inform Technol Biomed*. 2011;15(2):301–307.
34. Davies EB, Morriss R, Glazebrook C. Computer-delivered and web-based interventions to improve depression, anxiety, and psychological well-being of university students: A systematic review and meta-analysis. *J Med Internet Res*. 2014;16(5):e130.
35. Arnberg FK, Linton SJ, Hultcrantz M, Heintz E, Jonsen U. Internet-delivered psychological treatments for mood and anxiety disorders: A systematic review of their efficacy, safety, and cost-effectiveness. *PLoS One*. 2014;9(5):e98118.
36. Kypri K, Vater T, Bowe SJ, et al. Web-based alcohol screening and brief intervention for university students: A randomized trial. *JAMA* 2014;311(12):1218–1224.
37. Lipson SK, Speer N, Brunwasser S, Hahn E, Eisenberg D. Gatekeeper training and access to mental health care at universities and colleges. *J Adolesc Health*. 2014;55:612–619.
38. Lloyd-Evans B, Mayo-Wilson E, Harrison B, et al. A systematic review and meta-analysis of randomised

- controlled trials of peer support for people with severe mental illness. *BMC Psychiatry*. 2014;14:14–39.
39. Cultural Competency Statement Revision Task Force. Cultural competency statement. *J Am Coll Health*. 2011;59(5):436–437.
  40. Swift JK, Callahan JL. The impact of client treatment preferences on outcome: A meta-analysis. *J Clin Psychol*. 2009;65(4):368–381.
  41. Lindhiem O, Bennett CB, Trentacosta CJ, McLear C. Client preferences affect treatment satisfaction, completion, and clinical outcome: A meta-analysis. *Clin Psychol Rev*. 2014;34(6):506–517.
  42. Rosenbaum S, Tiedemann A, Sherrington C, Curtis J, Ward PB. Physical activity interventions for people with mental illness: A systematic review and meta-analysis. *J Clin Psychiatry*. 2014;75(9):964–974.
  43. Opie RS, O’Neil A, Itsiopoulos C, Jacka FN. The impact of whole-of-diet interventions on depression and anxiety: A systematic review of randomised controlled trials. *Public Health Nutr*. 2015;18:2074–2093.
  44. Van Straten A, Seekles W, van ‘t Veer-Tazelaar NJ, Beekman AT, Cuijpers P. Stepped care for depression in primary care: What should be offered and how? *Med J Aust*. 2010;192:36.