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Preferences for Evidence–Based Practice Dissemination in Addiction Agencies Serving Women: A Discrete–Choice Conjoint Experiment

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Abstract

Aim—To model variables influencing the dissemination of evidence-based practices to addiction service providers and administrators.

Design—A discrete–choice conjoint experiment. We systematically varied combinations of 16 dissemination variables that might influence the adoption of evidence-based practices. Participants chose between sets of variables.

Setting—Canadian agencies (n=333) providing addiction services to women.

Participants—Service providers and administrators (n=1379).

Measurements—We estimated the relative importance and optimal level of each dissemination variable. We used Latent Class analysis to identify subsets of participants with different preferences and simulated the conditions under which participants would use more demanding professional development options..

Findings—Three subsets of participants were identified: outcome sensitive (52%), process sensitive (29.6%) and demand sensitive (18.2%). Across all participants, the number of clients who were expected to benefit from an evidence-based practice exerted the most influence on dissemination choices. If a practice was seen as feasible, co-worker and administrative support influenced decisions. Client benefits were most important to outcome-sensitive participants; type of dissemination process (e.g. active versus passive learning) was more important to process-sensitive participants. Brief options with little follow-up were preferred by demand-sensitive participants. Simulations predicted that initiatives selected and endorsed by government funders would reduce participation.

Conclusions—Clinicians and administrators are more likely to adopt evidence-based addiction practices if the practice is seen as helpful to clients, and if it is supported by co-workers and program administration.

Keywords

addiction; conjoint analysis; discrete choice conjoint experiment; dissemination; implementation; reactance

Reviews reveal a growing number of effective approaches to the prevention and treatment of substance abuse (1, 2). Implementation studies, in contrast, suggest that front-line agencies have been slow to adopt evidence-based addiction practices (3–5). There is a need to develop more effective strategies for translating addiction research into practice improvements (3).

It is generally agreed that, to ensure implementation strategies are relevant, those in a position to apply research need to be involved throughout the knowledge-to-action process (6–9). This study used a discrete-choice conjoint experiment to inform the development of an implementation plan to increase the use of research by addiction agencies. Although discrete-choice conjoint experiments have emerged as a standard approach to the assessment of health service preferences (10–12), these methods have only recently been extended to the study of dissemination and implementation preferences (13, 14). Conjoint analysis conceptualizes dissemination and implementation as a set of content, process, and outcome attributes (12, 15). These might include the source of endorsements, the learning process, or the time needed to acquire new skills. Each attribute is defined by several levels. Training, for example, could require 1, 2, 3, or 4 days. Informants make choices between hypothetical approaches to implementation comprising systematic variations of the study's attribute levels (12, 15).

Discrete-choice conjoint experiments bring several conceptual and empirical strengths to the study of dissemination and implementation in the addiction field. Addiction agencies serve clients with complex problems while dealing simultaneously with significant resource and time constraints (16, 17). Implementation plans must consider competing clinical priorities and the need to divert time and resources from service and administrative activities. Planners must also anticipate controversies regarding the adoption of evidence-based practices (1) and disagreements regarding addiction treatment (18–22). The multi-attribute choices presented in discrete-choice conjoint experiments approximate the complexity of the

implementation decisions service providers and administrators must consider; these methods are more likely than simple ratings to engage the heuristics influencing actual professional development choices (23).

Views regarding addiction treatment may reflect philosophical biases, personal beliefs, and organizational politics (22, 24, 25). There is concern, therefore, that social desirability biases may influence responses to simple survey questions (26). Complex choices, in contrast, reveal covert preferences that participants do not report in simple surveys (27, 28).

Choice studies afford participants an opportunity to provide input into the design trade-offs developers consider. Conjoint analysis can estimate preference for an implementation strategy's attributes and simulate the response of participants to hypothetical options (15). Including preferred attributes could increase the likelihood that a professional development option is considered, and compensate for design elements with lower utility (e.g., extended training) that, while critical to the transfer of evidence-based practices, may discourage participation (29).

Although a large number of design factors influence the implementation of evidence-based addiction practices (30, 31), we know little about their relative importance to service providers and administrators. This study, therefore, examined the relative influence of 16 attributes of the practice change process on the decision of service providers and administrators in addiction agencies to participate in hypothetical professional development options. Because women bring different issues to treatment (e.g., pregnancy, intimate partner violence, or eating disorders) and may respond to different services than men (32, 33), we focused on addiction agencies serving women.

Previous studies reveal considerable variation in attitudes regarding the adoption of evidence-based addiction practices (3, 31, 34). We used Latent Class analysis to identify segments of participants with different implementation preferences. Given the importance of time requirements as a barrier to implementation (35–37), *Hypothesis 1* predicted that segment membership would vary as a function of the training and implementation time demands needed to accomplish practice change (1, 29, 38).

Based on the Theory of Planned Behavior (39, 40), *Hypothesis 2* postulated that segments preferring less demanding professional development options would expect fewer benefits to the adoption of evidence-based practices (attitudes), less support from co-workers and administrators (subjective norms), and more barriers to the application of research. They would report less confidence in their ability to use new approaches (perceived behavioural control) and be less intent on practice change.

Time demands constitute a barrier to the implementation of evidence-based practices (35–37). Hypothesis 3, therefore, predicted that participants would prefer a standard, 1-day professional development option rather than an enhanced approach with greater training time demands and extended follow-up support.

Next, we simulated the response of participants to a strategy for improving the utilization of a more demanding enhanced approach to implementation. According to the Theory of

Planned Behavior (39, 40), we predicted that providing evidence of benefit to clients (hypothesis 4) and increasing co-worker and administrative support (hypothesis 5) would increase preference for enhanced implementation.

Finally, decision control research (41–44) predicts that, although local selection processes would increase preference for an enhanced approach to implementation, a government-mandated selection process would reduce interest in this option (hypothesis 6).

Methods

Participants

The study was conducted according to Research Ethics Board approved protocols. We obtained a list of Canadian agencies providing addiction services for women from the National Directory of Drug and Alcohol Abuse Treatment. Of 714 agencies meeting inclusion criteria, 333 (46.5%) participated. A survey link, and up to five reminders, were e-mailed to each agency's service providers, managers, and executive directors. Participants endorsed a consent assuring confidentiality and the option of refusing to participate or withdrawing without consequence. Surveys were completed by 1379 (60%) of the 2305 individuals receiving survey links. Participants received a \$25.00 gift certificate and the option of entering a draw for an addiction conference trip.

Survey Development

We used qualitative methods to identify attributes of the dissemination and implementation process (12). Expert facilitators conducted one focus group with an advisory committee ($n=11$) of clinicians, administrators and policy makers, a second with content experts ($n=5$), and a third with research team members ($n=9$). In subsequent meetings, 16 four-level attributes addressing outcome, feasibility, support, and the implementation process were selected via consensus.

The internet survey was programmed using Sawtooth Software's SSI Web version 6.8. Figure 1 presents a sample choice task. Choice tasks presented three professional development options described by the levels of three attributes. This level of complexity was selected to balance statistical efficiency, which increases with the amount of information in each choice task, and informant efficiency, which declines as cognitive demands increase (45). The survey was piloted to ensure attribute levels were understood, relevant, and logical when combined to create professional development options (12, 46). Using an experimental design algorithm optimizing orthogonality, attribute level balance, and efficiency, we generated 999 versions of the survey (12). One version was assigned randomly to each participant.

Other Measures

We composed questions (1 = strongly disagree to 7 = strongly agree) measuring the attitudes, subjective norms, perceived behavioral control, and intent components of the Theory of Planned Behavior (40, 47). Table 1 summarizes this questionnaire.

Procedure

Participants completed an electronic consent, the Theory of Planned Behavior scale, 20 choice tasks, and demographic questions. Median time to complete the survey was 21.7 minutes.

Results

Latent Class analysis (12, 48–50) was computed to identify segments with different implementation preferences. As a finite mixture model, Latent Class assumes that choice data comprise several unobserved segments (49). Using a maximum likelihood criterion, Latent Class estimates the probability that each participant is a member of each segment. A three-segment solution based on fit indices, segment size, and interpretability was selected (15, 50). After inspecting the choice data, we labeled these outcome (52%), process (29.6 %), and demand sensitive (18.2%) segments. As Hypothesis 1 predicted, and as described below, segments differed with respect to their sensitivity to the time demands of training and implementation follow-up. Although Outcome Sensitive participants reported higher education, segment membership was not associated with job type (administrator versus service provider), agency size, rural versus urban location, or academic affiliation (Table 2).

A multivariate analysis of variance (MANOVA) across Theory of Planned Behavior questions yielded a significant segment effect, $F(10, 2732) = 2.7, p = 0.003$. In partial support of Hypothesis 2, demand-sensitive participants reported more barriers and fewer personal and agency influences encouraging research implementation than outcome-sensitive participants (Table 3). Demand-sensitive participants were less intent on using research than were process-sensitive participants.

Hierarchical Bayes (CBC/HB) was used to fit utility coefficients to each participant's choices (12, 51–54). Utility coefficients were standardized (zero-centered) with higher values reflecting stronger preferences (55). We computed importance scores reflecting the relative influence of the study's 16 attributes on implementation preferences by converting the sum of the utility value range of each attribute's levels to a percentage of the sum of the utility value ranges of all attributes (15). MANOVAs across importance scores (Table 4), $F(32, 2724) = 60.8, p < 0.001$, and utility values (Table 5), $F(96, 2660) = 26.6, p < 0.001$, yielded significant segment effects. Below, attributes are grouped into those reflecting expected outcome, feasibility, support, and process.

Expected Outcome

Importance scores (Table 4) show that the potential impact of a professional development option on clients exerted more influence on choices than any other attribute. Utility values show that all segments preferred evidence combining research with the real-world experiences of other agencies (Table 5). Client impact and evidence quality were more important to outcome-sensitive participants than to process- or demand-sensitive participants (Table 4).

Feasibility

Utility values show that all segments preferred professional development options focusing on easily applied practice changes that were compatible with their work. Compatibility was more important to outcome-sensitive than to demand- or process-sensitive participants. Difficulty applying the information in each option (implementation complexity), exerted a moderate influence on choices, particularly those of the demand-sensitive segment.

Support

All segments preferred professional development options supported by their co-workers and administrators and endorsed by experts. Co-worker and administrative support were more important to demand-sensitive participants than to outcome- or process-sensitive participants. The presenter's background as a clinician was more important to the demand-sensitive segment than to outcome- or process-sensitive participants. Endorsements were more important to the demand- and outcome-sensitive segments.

Implementation Process

Attributes of the implementation process were less important than those reflecting benefits to clients. Utility values show that all segments preferred options selected in collaboration with co-workers rather than by administrators or government funders. All segments preferred one-day, small-group workshops led by clinicians rather than by researchers, former clients, or administrators. Participants preferred active learning with questions and practice exercises. Although all participants preferred a self-paced internet option, they demonstrated little interest in web seminars, blogs, or social networking sites.

Importance scores show that content selection, group size, and learning processes were more important to process-sensitive participants than to outcome- and demand-sensitive participants. Outcome- and process-sensitive participants preferred an emphasis on skills; demand-sensitive participants preferred to focus on knowledge. Active learning was more important to the process-sensitive segment. Outcome-sensitive participants preferred that supplementary information was forwarded automatically. Process-sensitive participants preferred supplementary information at a website. Demand-sensitive participants were more sensitive to time costs. They preferred that supplementary information was sent at their request, and chose the fewest (one) implementation follow-ups.

Simulations

We used Randomized First Choice (RFC) simulations to predict the probability that each participant would prefer a series of implementation options composed by combining the levels of several attributes (56, 57). Although utility values reflect the relative influence of individual attribute levels, simulations predict the response of participants to the complex professional development options that would be encountered in addiction settings. This approach assumes that, adjusting for error, participants would prefer options with the highest composite utility (56, 57).

As an internal validity check (12), identical "hold-out" choice tasks were placed at positions 7 and 18 (15). Hold-out task choices were excluded from utility estimation. Using the utility

estimates derived from 18 choice tasks, the percentage of participants choosing each option was simulated. Table 6 shows mean absolute errors (MAE) computed by averaging the difference between the percentage predicted to, and actually choosing, each option (15). Low MAEs, and the percentage of participants making identical choices to the two hold-out tasks (94.1%), suggest high internal validity (15).

Simulation 1 (Table 7) tested Hypothesis 3's prediction that participants would prefer a less demanding implementation process. Standard implementation was a (i) one-day, (ii) large-group presentation, (iii) focusing 67% on knowledge and 33% on skills that were (iv) easily applied, without (v) review questions, practice or (vi) implementation follow-ups. Enhanced implementation was a (i) four-day, (ii) small-group presentation, (iii) focusing 67% on skills and 33% on knowledge, with (iv) very difficult to apply content, (v) review questions and practice, and (vi) three implementation follow-ups. As hypothesized, only 37.5% would choose enhanced implementation with demand-sensitive participants least likely (19.1%) to prefer this option.

We used the within-subjects main effect from mixed (simulation by segment) ANOVAs to examine hypotheses 4, 5, and 6. Hypothesis 4 postulated that expectation of greater benefits to clients would increase preference for enhanced implementation. As predicted, when enhanced implementation benefited 67%, but standard implementation benefited only 33% of clients, share of preference for enhanced implementation increased significantly (e.g., from 37.5% in Simulation 1 to 70.9% in Simulation 2). A significant simulation x segment interaction suggests evidence exerted less influence on the predicted preference of demand-sensitive participants.

Simulation 3 focused on the incremental contribution of subjective norms to preference for the enhanced option (39, 40). As Hypothesis 5 predicted, with co-worker and administrative support at 67% for enhanced versus 33% for standard implementation, preference for enhanced implementation increased significantly (e.g., from 70.9% in Simulation 2 to 92.5% in Simulation 3). Support exerted less influence on the predicted preference of demand-sensitive participants.

As Hypothesis 6 predicted, if government funders selected and endorsed enhanced implementation, but co-workers and colleagues selected and endorsed the standard approach, preference for enhanced implementation declined significantly (e.g., from 92.5% in Simulation 3 to 76% in Simulation 6). Demand-sensitive participants showed a greater reduction in predicted preference for professional development options that were government mandated.

Discussion

We used a discrete-choice conjoint experiment to model the professional development preferences of service providers and administrators from addiction agencies serving women. This is the first application of these methods to the addiction field. Latent Class Analysis yielded outcome-sensitive, process-sensitive, and demand-sensitive segments. Although their

sensitivity to some attributes differed, these segments agreed on the overall design of a strategy for implementing evidence-based addiction practices.

As hypothesized, evidence of benefit to clients dominated choices. Although participants preferred brief approaches with limited follow-up support, they were willing to devote more time to the implementation of practice changes that were selected in collaboration with coworkers, benefited a greater number of clients, were compatible with existing practices, were easily implemented, and supported by colleagues and administrators.

Despite similarities, we observed variation in the sensitivity of the three segments to different attributes of the implementation process. Benefits to clients, evidence quality, and the compatibility of professional development content with current practices were more important to outcome-sensitive participants. The implementation process exerted more influence on the choices of process-sensitive participants. Demand-sensitive participants showed a stronger preference for brief options, knowledge versus skill, and fewer implementation follow-ups. They reacted most negatively to options selected and endorsed by government funders. In comparison to outcome-sensitive participants, demand-sensitive participants reported less education, fewer normative influences encouraging research application, and more implementation barriers. As the Theory of Planned Behavior predicts (40), they were least likely to prefer an enhanced approach to implementation.

Two-Stage Decisions

This study suggests that participants approached professional development decisions via a two-stage process (58–60). In stage one, referred to as the formation of a consideration set (61, 62), individuals choose whether to consider an option. Stage one decisions are accomplished quickly and intuitively on the basis of limited information (23, 58–60); only options benefiting a significant proportion of clients would be considered.

In stage two, a second set of attributes would be weighed more carefully (58–60). Compatibility and implementation complexity, for example, exerted a strong influence on professional development decisions. This observation is consistent with both theory (30) and research (63–65).

If an effective option seems feasible, participants would consider the social context of the implementation process. Participants preferred a local content selection process supported by co-workers and administrators. This is consistent with the normative influences postulated by the Theory of Planned Behavior (40) and evidence that supportive agency leaders increase the adoption of evidence-based addiction practices (2).

Finally, participants would consider attributes of the implementation process. Participants chose small-group options delivered by clinicians rather than researchers, administrators or former clients. They preferred options that included practice, review questions, and self-paced internet activities, an active learning approach supported by implementation research (2, 38).

Implications

Advertise Benefits—Gagnon suggests that those in a position to apply scientific information be engaged in an interactive process to “craft messages” supporting the implementation process (6). This study’s findings suggest advertising designed to encourage participation in the implementation of evidence-based addiction services should begin with attributes encouraging the consideration of professional development options. Effective advertising should feature evidence of benefit to clients derived from scientific evidence, expert endorsements, and the real world experience of addiction professionals (66). Presenting benefits in a format that influences professional development choices requires that clinical trials adopt an interpretable approach to outcome reporting (67).

Advertise Compatibility—To reduce the perceived barriers that limit the adoption of evidence-based addiction practices (31), advertising should emphasize compatibility and ease of implementation. This finding is consistent with dissemination models (30, 31) and the Theory of Planned Behavior suggesting confidence in one’s ability to implement evidence-based practices would increase the intent to pursue professional development (39, 40).

Manage the Social Context—Simulations suggest ensuring that co-workers and administrators actively support organizational learning objectives would increase commitment to the more demanding enhanced approaches needed to implement evidence-based practices (1, 2, 29). These results are consistent with theory regarding normative influences (39, 40) and previous implementation research (35, 37, 68).

Encourage Local Content Selection—This study’s findings suggest that including participants from each segment in local decisions is more likely than government-mandated approaches to build the support needed to implement practice improvements. This is consistent with evidence that decision control increases readiness for organizational change (41) and research suggesting employees respond more favorably to decision processes that are perceived to be transparent, fair, and inclusive (43, 69). Previous studies suggest that including opinion leaders from each segment would enhance the impact of local decisions (37, 70, 71).

Simulations predicted that, if government funders selected and endorsed an enhanced option, a significant percentage of participants would shift to a less effective alternative. This finding is consistent with the unintended reactance observed when decision-making freedom is perceived to be restricted (72). Although reactance has been reported in substance abuse treatment (73–76) and prevention programs (77–79), and is thought to limit the adoption of evidence-based practices (80, 81), this is the first experimental demonstration of reactance effects on professional development choices. This finding is important given increasing government involvement in the implementation of evidenced-based addiction services (1, 82).

Reactance also constitutes a dispositional characteristic (83). Dispositional reactance, for example, interacts with addiction treatment strategies such that individuals with higher reactance respond better to less directive approaches (84). Those with low reactance respond

better to more directive strategies (84). In the present study, demand-sensitive participants evidenced the most negative response to government-mandated programs.

Engage the Demand Sensitive Segment—The importance of co-worker and administrative support suggests that a failure to secure the backing of service providers and administrators in the demand-sensitive segment could undermine the implementation of evidence-based practices (35, 37). In this study, demand-sensitive participants showed a stronger preference for brief training and limited follow-up support. This finding is consistent with evidence that time demands constitute a significant barrier to the implementation of evidence-based practices (35, 36). Our results suggest this segment would participate in an approach combining brief skill-focused workshops with self-paced internet program (85). This segment might also be engaged via an approach incrementally introducing the individual components of evidence-based treatments (1, 2, 31, 86). Although the flexible application of evidence-based components shows promise as an approach to the treatment of complex mental health problems (87), addiction trials are needed.

Limitations

We conducted surveys in addiction agencies serving women in the context of Canada's publicly-funded health system. These findings require replication in other contexts. Second, this study focused on the decision to participate in a professional development option. The attributes influencing sustained participation or the ultimate adoption of evidence-based practices may differ (88). Finally, it would be helpful to study professional development preferences using a new generation of choice methods capturing the two-stage decision process reflected in this study's findings (89).

Conclusion

Disseminating evidence-based addiction services requires a strategy considering both the professional development decision process and the design preferences of different segments. The staff and administrators in addiction agencies serving women are most likely to consider practice changes benefiting a significant percentage of their clients. If an option is feasible and effective, co-worker and administrative support will influence decisions. Although local decisions would enhance engagement in the implementation process, initiatives selected and endorsed by government funders may elicit reactance and reduce participation.

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Click below the professional development option you prefer:

Option 1	Option 2	Option 3
<div><i>Endorsed by a colleague</i> <i>Will help 33% of my clients</i> <i>1 day of my time</i></div> <div>☐</div>	<div><i>Endorsed by government</i> <i>Will help 67% of my clients</i> <i>2 days of my time</i></div> <div>☐</div>	<div><i>Endorsed by an expert</i> <i>Will Help 67% of my clients</i> <i>3 days of my time</i></div> <div>☐</div>

Figure 1.

A sample of the format used in the 20 choice tasks completed by each participant. Note that Sawtooth Software's experimental design module composed and randomly selected one of 999 design sequences for each participant.

Table 1

Description of Theory of Planned Behavior Scale.

Subscales	No. of items	α^a	Sample Question
Attitudes: Research Benefits	6	0.94	<i>Using research to inform my work would help me improve outcomes for my women clients</i>
Subjective Norms: Personal Influences	3	0.75	<i>Using research to inform my work would be encouraged by my colleagues</i>
Subjective Norms: Agency Influences	3	0.85	<i>In my agency the culture values the use of research in practice</i>
Behavioral Control: Barriers	2	0.71	<i>Using research to inform my work would take too much time</i>
Behavioral Control: Research Self-Efficacy	3	0.90	<i>I know how to evaluate the quality of research relevant to my work</i>
Intent	2	0.66	<i>To get research to inform my work I would spend a total of 1 day reading research papers</i>

^a α = Chronbach's alpha

Table 2

Demographic characteristics of the Outcome, Process, and Demand Sensitive segments.

	<i>Segment</i>				χ^2
	<i>n</i>	<i>Outcome^a</i>	<i>Process^b</i>	<i>Demand^c</i>	
Sample Size	1379	52.0	29.6	18.2	
Job type					5.0
Administrator	354	54.8	25.1	20.1	
Service Provider	980	51.3	31.3	17.3	
Addiction Professional					3.0
Yes	795	54.2	28.4	17.4	
No	542 ^f	55.2	24.7	20.1	
Years in position					12.4 [*]
< 2 years	318	45.9	33.6	20.4	
2 – 5 years	395	56.2	30.1	13.7	
> 5 years	624	52.7	27.6	19.7	
Level of Education					19.0 ^{**}
High School	56	35.7	30.4	33.9	
College	363	46.8	32.5	20.7	
Any university	916	55.2	28.7	16.0	
Agency Location					0.2
Not urban	225	53.3	28.4	18.2	
Urban	1112	51.9	30.0	18.1	
Agency Size					2.2
Small (1 – 10 staff)	783	51.0	30.8	18.3	
Medium (11 – 20 staff)	277	52.0	28.9	19.1	
Large (20 + staff)	276	55.8	27.5	16.7	
Academic Affiliation					0.9
No	169	54.4	26.6	18.9	
Yes	1167	51.8	30.2	18.0	

^a outcome-sensitive segment;

q process-sensitive segments,

c demand-sensitive segment. Segments represent clusters of participants with similar professional development preferences. Segments were derived from latent class analysis of participant choices.

f Of the 542 participants who did not define themselves as addiction professionals, 396 were clinicians, 121 were program managers, administrators, or clinical supervisors, and 25 were executive directors.

*** $p<0.05$,

**** $p<0.01$

Table 3
Theory of Planned Behavior Scale Scores for outcome, process, and demand sensitive segments.

Content of Question	Segment									
	Outcome			Process			Demand			η^2
	M	(SD)		M	(SD)		M	(SD)	F	
Attitudes: Research Benefits	34.8	(7.9)		34.6	(7.4)		33.7	(8.3)	2.0	0.00
Subjective Norms: Personal Influences	15.6	(3.4)		15.4	(3.6)		14.9	(3.8)	4.3*	O>D 0.01
Subjective Norms: Agency Influences	15.6	(3.4)		15.4	(3.6)		14.9	(3.8)	4.3*	O>D 0.01
Perceived Behavioral Control: Research Self Efficacy	15.3	(3.9)		15.3	(3.8)		15.5	(1.4)	0.3	0.00
Perceived Behavioral Control: Barriers to Evidence-based Practice	5.9	(2.7)		6.0	(2.8)		6.4	(2.9)	3.6*	D>O 0.01
Intent	8.3	(3.1)		8.5	(3.2)		7.8	(3.4)	3.9*	P>D 0.01

O = Outcome Sensitive segment; P = Process Sensitive segment; D = Demand Sensitive segment. SD = Standard Deviation ; $C = Dunnett$'s $C; \eta^2 = Eta^2$
* p<0.05

Table 4

Importance scores for Outcome, Process, and Demand Sensitive segments.

Attribute	Segment												F	C	η ²	
	Outcome						Demand									
	R	M	(SD)	R	M	(SD)	R	M	(SD)	R	M	(SD)				
Expected Outcome																
Impact on Clients	1	18.5	(1.7)	1	16.0	(2.3)	1	13.8	(3.9)		397.9	***	O>P>S	0.37		
Evidence Quality	3	8.9	(1.1)	3	8.2	(1.3)	5	7.1	(2.2)		134.1	***	O>P>S	0.16		
Feasibility																
Compatibility	2	12.3	(1.1)	2	10.5	(1.8)	2	8.7	(2.8)		427.1	***	O>P>D	0.38		
Implementation Complexity	4	6.4	(1.2)	4	6.6	(1.3)	6	6.9	(2.0)		11.3	***	D,P>O	0.02		
Time Cost	15	3.0	(1.1)	16	2.6	(1.1)	12	4.7	(1.9)		220.5	***	D>O>P	0.24		
Support																
Co-Worker Support	5	6.3	(1.2)	6	6.1	(1.4)	7	6.6	(2.0)		11.4	***	D,O>P	0.02		
Administrative Support	6	6.0	(1.2)	4	6.6	(1.4)	3	7.6	(2.2)		109.3	***	D>P>O	0.14		
Source of Endorsement	8	5.2	(1.1)	10	4.8	(1.2)	10	5.2	(1.7)		18.3	***	D,O>P	0.03		
Collaborative selection process	9	4.7	(1.5)	6	6.1	(1.6)	8	6.1	(2.6)		102.6	***	D,P>O	0.13		
Implementation Process																
Presenter's Background	7	5.5	(1.4)	8	5.9	(1.6)	4	7.3	(2.3)		112.5	***	D>P>O	0.14		
Accessing Supplementary Information	10	4.6	(0.8)	12	4.5	(0.8)	11	5.1	(1.4)		35.3	***	D>O>P	0.05		
Internet Options	11	4.5	(1.3)	13	4.4	(1.3)	9	5.4	(1.9)		47.4	***	D>O,P	0.06		
Focus on Knowledge versus Skills	12	4.3	(1.3)	9	5.7	(1.3)	13	4.5	(1.8)		146.2	***	P>D,O	0.18		
Individual versus Group Format	13	3.7	(0.9)	11	4.7	(0.9)	14	4.3	(1.5)		108.8	***	P>D>O	0.14		
Active versus Passive Learning	14	3.5	(1.1)	14	4.1	(1.2)	15	3.6	(1.6)		29.8	***	P>D,O	0.04		
Implementation Follow-ups	16	2.5	(0.9)	15	3.2	(0.9)	16	3.0	(1.2)		83.3	***	P>D>O	0.11		

Highest importance score for each attribute is bolded.

R=Relative rank of importance score; importance scores are standardized measures reflecting the relative influence of variations in the levels of each attribute on participant choices; an importance score of 10 denote twice as much influence as a score of 5; O = outcome-sensitive segment; P = process-sensitive segment; D = demand-sensitive segment. SD = Standard Deviation ; C = Dunnett's C ; $\eta^2 = \text{Eta}^2$

p<0.001

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Table 5

Standardized (zero-centered) utility values^a for Outcome, Process, and Demand Sensitive segments.

Content of Attribute	Segment						C	η^2
	Outcome		Process		Demand			
	M	(SD)	M	(SD)	M	(SD)		
Expected Outcome								
Impact on Clients								
Will help 0% of my clients	-171.1	(10.9)	-157.3	(15.6)	-129.0	(46.4)	316.0***	D>P>O 0.32
Will help 33% of my clients	-18.9	(12.0)	-3.8	(17.0)	6.6	(30.2)	217.7***	D>P>O 0.24
Will help 67% of my clients	65.3	(40.5)	63.9	(13.0)	50.5	(29.8)	79.6***	O,P>D 0.10
Will help 100% of my clients	124.7	(17.6)	97.2	(26.2)	71.9	(50.1)	349.2***	O>P>D 0.34
Evidence Quality (that program works)								
None	-90.8	(11.9)	-84.0	(14.6)	-61.6	(37.4)	203.8***	D>P>O 0.23
Staff from other agencies	17.7	(11.6)	23.1	(12.0)	14.7	(21.2)	32.5***	P>D,O 0.05
Research	23.4	(11.6)	16.3	(13.3)	13.5	(25.0)	50.7***	O>D,P 0.07
Research and staff from other agencies	49.7	(11.5)	44.6	(13.6)	33.3	(26.9)	98.7***	O>P>D 0.13
Feasibility								
Compatibility								
0% compatible with my work	-114.8	(9.0)	-102.8	(16.6)	-78.1	(38.5)	321.6***	D>P>O 0.32
33% compatible with my work	-13.3	(7.8)	-2.8	(10.3)	.11	(17.7)	199.6***	D>P>O 0.23
67% compatible with my work	46.6	(8.2)	43.3	(10.9)	36.0	(20.3)	72.0***	O>P>D 0.10
100% compatible with my work	81.6	(12.5)	62.3	(18.5)	42.0	(36.2)	374.7***	O>P>D 0.35
Implementation Complexity								
Information is very easy to apply	45.2	(11.0)	43.9	(12.4)	42.4	(19.5)	4.3*	0.01
Information is easy to apply	43.9	(9.6)	43.9	(11.1)	43.0	(20.4)	0.5	0.00
Information is difficult to apply	-35.4	(10.3)	-30.6	(12.4)	-28.9	(21.2)	28.8***	D,P>O 0.04
Information is very difficult to apply	-53.7	(11.5)	-57.3	(12.4)	-56.5	(23.2)	9.1***	O>P 0.01
Time Cost								

Content of Attribute	Segment									
	Outcome			Process			Demand			
	M	(SD)		M	(SD)	M	(SD)	F	C	η^2
Requires 1 day of my time	19.0	(12.3)		12.8	(12.9)	34.1	(21.5)	170.2***	D>O>P	0.20
Requires 2 days of my time	12.1	(7.9)		11.2	(9.0)	7.3	(15.5)	21.0***	O,P>D	0.03
Requires 3 days of my time	-5.6	(7.3)		-3.3	(7.9)	-6.6	(14.0)	12.4***	P>D,O	0.02
Requires 4 days of my time	-25.5	(11.3)		-20.6	(13.1)	-34.9	(20.9)	81.2***	P>O>D	0.11
Support										
Co-Worker Support										
Supported by 0% of my co-workers	-59.1	(12.7)		-59.5	(15.3)	-60.3	(24.0)	0.5		0.00
Supported by 33% of my co-workers	-5.3	(8.3)		0.9	(9.8)	0.3	(15.8)	55.7***	D,P>O	0.08
Supported by 67% of my co-workers	24.1	(9.2)		26.1	(10.1)	33.7	(17.8)	66.8***	D>P>O	0.09
Supported by 100% of my co-workers	40.4	(12.0)		32.5	(13.7)	26.3	(24.8)	86.9***	O>P>D	0.11
Administrative Support										
Discouraged by my boss	-58.9	(12.6)		-66.2	(13.7)	-74.3	(25.6)	92.5***	O>P>D	0.12
My boss is neutral	-3.1	(7.3)		1.8	(9.1)	3.8	(15.1)	61.3***	D,P>O	0.08
Supported by my boss	26.9	(8.9)		27.2	(9.8)	35.1	(18.4)	51.7***	D>O,P	0.07
Strongly supported by my boss	35.1	(10.0)		37.2	(11.1)	35.4	(20.3)	3.8*	P>O	0.01
Source of Endorsement										
Not endorsed	-46.0	(11.0)		-43.0	(12.8)	-39.7	(24.4)	18.2***	D,P>O	0.03
Endorsed by the government	-0.0	(12.0)		-3.9	(13.1)	-1.0	(21.5)	9.2***	O>P	0.01
Endorsed by a colleague	10.2	(9.8)		17.1	(11.2)	8.5	(19.0)	52.2***	P>D,O	0.07
Endorsed by an expert	35.9	(11.4)		29.8	(11.8)	32.2	(20.3)	27.5***	O>D,P	0.04
Collaborative Selection Process										
Government funders select the content	-33.9	(15.4)		-42.5	(15.4)	-37.1	(28.7)	27.3***	D,O>P	0.04
Administrators select the content	-19.6	(14.3)		-28.7	(14.5)	-17.4	(26.6)	47.0***	D,O>P	0.06
I select the content	15.3	(14.2)		18.5	(15.2)	7.9	(25.5)	30.5***	P>O>D	0.04
My co-workers and I select the content	38.2	(15.3)		52.7	(15.1)	46.6	(29.6)	80.7***	P>D>O	0.12

Content of Attribute	Segment						F	C	η^2
	Outcome		Process		Demand				
	M	(SD)	M	(SD)	M	(SD)			
Implementation Process									
Presenter's Background									
Presenter is an administrator	-34.3	(15.9)	-48.7	(6.3)	-35.2	(29.3)	78.7***	D,O>P	0.10
Presenter is a former client	-22.8	(23.0)	19.8	(29.5)	-26.8	(43.4)	313.1***	P>D,O	0.31
Presenter is a researcher	13.9	(16.8)	-0.9	(17.7)	12.2	(31.1)	71.4***	D,O>P	0.09
Presenter is a clinician	43.3	(17.1)	29.9	(20.7)	49.7	(29.1)	84.2***	D>O>P	0.11
Accessing Supplementary Information									
More information is not available	-47.7	(8.4)	-46.1	(8.9)	-47.1	(18.2)	2.8***	P>O	0.00
More information is on a website	18.6	(9.9)	16.8	(11.7)	16.6	(18.7)	3.9*	O>P	0.01
More information is sent if I request it	9.4	(8.4)	13.3	(9.5)	19.6	(15.8)	91.6***	D>P>O	0.12
More information is automatically sent	19.6	(9.2)	16.0	(10.5)	10.8	(18.0)	55.4***	O>P>D	0.08
Internet Options									
Involves no electronic media	1.0	(20.5)	-1.2	(24.5)	4.8	(37.7)	4.3*		0.01
Involves a blog, list serve, twitter, or face book	-28.5	(19.0)	-32.4	(22.4)	-31.7	(35.3)	12.6***	D,P>O	0.02
Involves a web seminar	11.5	(11.5)	8.8	(13.1)	7.9	(20.4)	8.2***	O>D,P	0.01
Involves a self-paced internet program	26.0	(10.8)	24.7	(12.7)	18.9	(21.9)	24.1***	O,P>D	0.03
Focus on Knowledge versus Skills									
100% focus on knowledge	-35.5	(15.4)	-51.4	(13.4)	-19.3	(30.3)	240.0***	D>O>P	0.26
67% focus on knowledge, 33% on skills	14.8	(12.2)	18.6	(14.8)	16.5	(22.8)	7.7***	P>O	0.01
33% focus on knowledge, 67% on skills	27.0	(13.5)	35.9	(12.9)	10.4	(22.2)	219.5***	P>O>D	0.24
100% focus on skills	-6.4	(15.3)	-3.2	(18.0)	-7.6	(28.1)	5.3**	P>O	0.01
Individual versus Group Format									
Includes no 1:1 contact or workshops	-32.9	(11.4)	-43.3	(10.7)	-30.3	(22.4)	93.2***	D,O>P	0.12
Includes 1:1 contact	2.5	(9.5)	6.4	(11.0)	2.5	(18.7)	14.7***	P>D,O	0.02
Includes a small group workshop	24.3	(9.4)	29.3	(10.6)	25.2	(18.3)	23.1***	P>D,O	0.03

Content of Attribute	Segment						F	C	η^2
	Outcome		Process		Demand				
	M	(SD)	M	(SD)	M	(SD)			
Includes a large group workshop	6.1	(10.9)	7.6	(11.5)	2.6	(20.4)	11.2***	O,P>D	0.02
Active versus Passive Learning									
No review questions or practice exercises	-31.2	(12.7)	-37.6	(13.4)	-22.0	(24.3)	78.2***	D>O>P	0.10
Includes review questions	-4.3	(8.9)	-4.4	(9.6)	-2.4	(16.4)	3.3*		0.01
Includes practice exercises	12.8	(11.3)	17.9	(12.3)	6.3	(20.3)	57.3***	P>O>D	0.08
Review questions & practice exercises	22.7	(9.0)	24.1	(10.4)	18.1	(16.3)	23.9***	O,P>D	0.03
Number of Implementation Follow-ups									
Includes 0 implementation follow-ups	-22.4	(11.4)	-31.4	(10.6)	-14.2	(20.6)	134.4***	D>O>P	0.16
Includes 1 implementation follow-up	7.0	(7.7)	9.3	(8.4)	11.6	(14.4)	23.8***	D,P>O	0.03
Includes 2 implementation follow-ups	10.6	(8.1)	13.1	(9.0)	7.3	(14.7)	27.7***	P>O>D	0.04
Includes 3 implementation follow-ups	4.7	(10.6)	8.9	(11.1)	-4.6	(17.4)	96.1***	P>O>D	0.12

Preferred attribute level for each segment is bolded.

^aUtility values are standardized (zero-centred) measures of the relative preference for each attribute level. Higher utility values reflect stronger preferences O = outcome-sensitive segment; P = process-sensitive segment; D = demand-sensitive segment.

SD = Standard Deviation ; C=Dunnnett's C ;

η^2 = Eta².

* p<0.05,

** p<0.01,

*** p<0.001

Table 6

Observed versus simulated hold-out task responses

Task	Option 1			Option 2			Option 3			MAE
	Observed	Predicted	(SE)	Observed	Predicted	(SE)	Observed	Predicted	(SE)	
1	94.3	98.4	0.2	1.0	0.1	0.1	4.6	1.4	0.2	2.7
2	94.1	98.4	0.2	1.2	0.1	0.1	4.7	1.4	0.2	2.9

SE = Standard Error; MAE = mean absolute error; Lower MAEs reflect more accurate predictions.

Table 7

Mean percentage of participants in each segment predicted to prefer different professional development options.

Professional Development Option	Segment					
	Total Sample		Outcome		Process	
	M%	(SD)	M%	(SD)	M%	(SD)
Simulation 1						
Standard	62.5	(40.8)	66.3	(39.0)	44.3	(41.5)
Enhanced	37.5	(40.8)	33.7	(39.0)	55.7	(41.5)
Simulation 2						
Standard	29.1	(39.4)	22.2	(34.7)	16.0	(30.2)
Enhanced + Evidence ^a	70.9	(39.4)	77.8	(34.7)	84.0	(30.2)
Simulation 3						
Standard	7.5	(23.5)	2.1	(11.3)	0.7	(6.2)
Enhanced + Evidence + Support ^b	92.5	(23.5)	97.9	(11.3)	99.3	(6.2)
Simulation 4						
Standard	24.0	(38.4)	15.5	(31.4)	15.1	(31.0)
Enhanced + Evidence + Support + Government Selection ^c	76.0	(38.4)	84.5	(31.4)	84.9	(31.0)

SD = Standard Deviation

^a *Enhanced (simulation 1) versus enhanced + evidence (simulation 2)*

Simulation = $F(1, 1376) = 850.6, p < 0.001, \eta^2 = .38$

Segment = $F(2, 1376) = 149.8, p < 0.001, \eta^2 = 0.18; P > O > D$

Simulation x Segment = $F(2, 1376) = 100.9, p < 0.001, \eta^2 = 0.13$

^b *Enhanced + evidence (simulation 2) versus enhanced + evidence + support (simulation 3)*

Simulation = $F(1, 1376) = 635.5, p < 0.001, \eta^2 = 0.32$

Segment = $F(2, 1376) = 328.8, p < 0.001, \eta^2 = 0.32; P > O > D$

Simulation x Segment = $F(2, 1376) = 33.0, p < 0.001, \eta^2 = 0.05$

^c *Enhanced + evidence + support (simulation 3) versus enhanced + evidence + support + government selection (simulation 4)*

Simulation = $F(1, 1376) = 435.0, p < 0.001, \eta^2 = 0.24$

Segment = $F(2, 1376) = 299.4, p < 0.001, \eta^2 = 0.30; O, P > D$

Simulation x Segment = $F(2, 1376) = 23.3, p < 0.001, \eta^2 = 0.33$

η^2 = partial eta squared