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End-User Insights from a Government of Canada Workplace Well-Being Intervention Pilot

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Scientific Letter

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Overview

In response to a request from Mr. Chad Hartnell, Director of Operations at the Impact and Innovation Unit in the Privy Council Office (PCO) and Mr. François Bariteau, Director of Total Health Management at Department of National Defence (DND), this Scientific Letter (SL) provides an overview of a short survey conducted to assess user experience of participating in a pilot study on federal workplace well-being led by the Deputy Ministers Task Force on Public Sector Innovation (TF-PSI). In addition, this SL presents recommendations for future research and initiatives of this nature.

Background

Workplace well-being initiatives are a priority for the Government of Canada (GoC) and are aimed at enhancing employees' work experience and overall effectiveness. Specifically, aligned with the 2016 Federal Public Service Workplace Mental Health Strategy (Treasury Board of Canada Secretariat, 2016) and the 2017 DND Defence Policy (National Defence, 2017), researchers at DND prioritize the development of programs that support the health of civilian employees as well as military personnel. The TF-PSI has supported this endeavour by forming a team of GoC Entrepreneurs (GCEs) to investigate workplace well-being using evolving technological programs. One such team, in collaboration with Defence Research Development Canada (DRDC) researchers, conducted a pilot study that leveraged new technology, specifically a mobile app, focused on workplace well-being among GoC employees. The primary research objective of the pilot was to investigate the feasibility and utility of employing a rewards-based incentive through a mobile delivery platform. Also included was a user experience survey, the focus of this SL, which was conducted in order to capture participants' self-report assessments of various features that were included in the pilot, such as utilizing nudges to promote positive interactions with work colleagues. More generally, this survey also provides valuable user feedback in order to help inform future research and initiatives of this nature within the GoC.

Methods

Mobile App Selection

To assess the advantages of leveraging a mobile app with an established user-base, Carrot Rewards was selected as an example app. In brief, the Carrot Rewards program employed a social reward approach to promote positive behaviour change. In this case, physical activity was encouraged by the tracking of daily step counts on a pedometer in the Carrot Rewards app. Users received points for meeting daily step goals, tracked by the in-app pedometer. The points could be exchanged for redeemable consumer loyalty points associated with a variety of companies. At the time of pilot launch, the app had been downloaded by over 700,000 Canadians, including previous use by three provincial governments (i.e., British Columbia, Ontario, and Newfoundland). In this research the Carrot Rewards app also deployed nudges and blog posts, designed by the researchers and described in more detail below, that were designed to encourage a variety of positive workplace relationship-related behaviours, for instance, initiating positive interactions with co-workers.

Participants

Volunteers were recruited primarily via GoC departmental email newsletters. In order to participate GoC participants downloaded the Carrot Rewards app and used a specialized code that was generated based on their department. A total of 1,470 codes were redeemed at study launch.¹ The pilot included participants from five GoC departments, the Department of National Defence ($N = 663$), Health Canada ($N = 474$), Transport Canada ($N = 247$), Canada School of Public Service ($N = 19$), and Statistics Canada ($N = 67$).² The sample included a majority of women (63.2%) and most participants were aged 35–44 years (32.0%).³ Of the total codes that were redeemed at the launch of the pilot, one-third of participants (32.9%; $N = 484$) completed the user experience survey, which was the final questionnaire of the pilot, and is the focus of this SL. User experience survey participants ($N = 484$)⁴ were primarily from DND (46.1%) and Health Canada (28.3%). Additionally, the sample included participants from Transport Canada (14.9%), Canada School of Public Service (2.2%), and Statistics Canada (2.1%).⁵

¹ For comparison to our sample, here we provide the 2018 population of each of the five GoC departments that participated: DND ($N = 125,500$), Health Canada ($N = 9,730$), Transport Canada ($N = 5,362$), Canada School of Public Service ($N = 599$), and Statistics Canada ($N = 5,210$).

² Recruitment efforts were likely stronger in some departments than others thus the differences in participation rates across departments.

³ Participant demographics were only collected at the launch of the pilot.

⁴ The user experience survey occurred at the conclusion of the pilot study; rate of completion in the pilot decreased at each stage.

⁵ Approximately 6% of participants indicated they were from different GoC departments, outside of the five departments listed above.

Design⁶

Participants were invited to participate in the pilot employee well-being study primarily via email. Within the Carrot Rewards mobile app were embedded notifications (or “nudges”) that were distributed over the course of the pilot. Nudges were titled with statements such as: “*Be present*” and “*Show someone you care*” followed by a message such as: “*If you don’t need it, keep your phone on silent/don’t look at it during your meetings this week*” and “*Write a kind and supportive note or email to a peer*”. In addition, in an effort to provide participants with more information about the importance of employee well-being, blog posts, authored by experts in the researchers’ network were included in the pilot; authors were selected based on their experience with the subject matter of each blog post. Blogs were linked at the end of quizzes (described below) two to six. The title and content of both the nudges and blog posts were related to the topic of each quiz.

In the original design of the study, behavioural data were collected through the six quizzes, also embedded within the app and designed and adapted for the purposes of the pilot employee well-being study. Quiz topics included workplace relationships, interpersonal communication, recognition and reward, work stress, and trust, for which participants also received reward points upon completion (see Boland, D’Agata, Granek, Nazarov & Jaz, 2019 for an in-depth description of the methodology).⁷ After the sixth quiz participants also received a link to a user experience survey, described next.

User Experience Survey⁸

The researchers created a 16-item survey to assess participants’ experience of participating in the pilot. The survey assessed methods of recruitment, engagement and motivation, overall experience, on-boarding (i.e., ease of joining), adherence, incentives, education materials (i.e., blog posts), and nudges. For the purposes of this SL, we present findings pertaining to the following items (see Annex A for complete list of rating scales):

- Overall, how would you rate your experience in this pilot?
- How did you hear about the pilot?
- What factor(s) motivated you to join the pilot?
- What were the main motivating factors for you to continue using the app?
- Do you have any additional comments about the rewards?

⁶ Ethics approval was granted by DRDC Toronto’s Human Research Ethics Committee Protocol No. 2018-065 for both the Workplace Well-Being Rewards Pilot and the User Experience Survey.

⁷ Quiz items were written by the researchers or drawn from other sources, including the Public Service Employee Survey (Treasury Board of Canada Secretariat, 2019), the Work-Related Basic Need Satisfaction Scale (Van den Broeck, Vansteenkiste, De Witte, Soenens & Lens, 2010), and the Job Satisfaction Survey (Spector, 1985). In the final quiz, participants were provided with a link to complete our user experience survey which is the focus of data analysis in this SL. Due to low initial participation rates, randomization failure occurred while assigning participants into the experimental (received nudges) and control (did not receive nudges) conditions. As such, the control group was removed from the data and analyses were only conducted on participants that received nudges. In other words, no comparison could be made between the two groups, restricting our ability to assess behavioural change during the pilot.

⁸ Sample sizes vary in our results section due to missing data on some items of the user experience survey.

- Did you like the blogs?
- Did you like the nudges?

Statement of Results

Most participants who completed the user survey (83.5%) indicated that they had a positive experience participating in the pilot well-being program (see Figure 1).

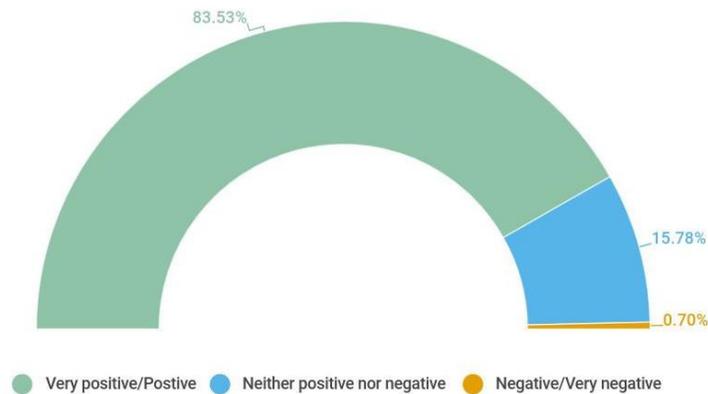


Figure 1: Proportion of participants' perceptions of the pilot overall (n = 431).

Engagement

Two items were selected to explore the theme of engagement. First, we examined how participants were recruited to the pilot study (see Figure 2). Most participants (42.8%) indicated that they heard about the pilot from a department newsletter.

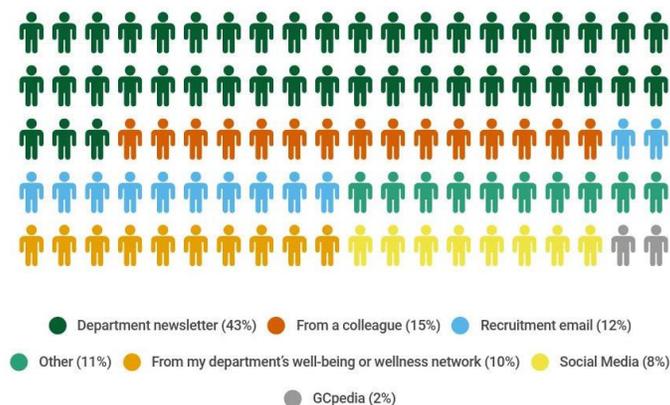


Figure 2: Percentage of participants by recruitment method (n = 457).

Next, we examined the recruitment method by department (see Figure 3). Similar patterns emerged such that a department newsletter was commonly selected; however, recruitment methods were somewhat distinct for Statistics Canada and Canada School of Public Service. The most commonly reported recruitment methods for Statistics Canada participants were via a recruitment email (37.5%) or from their department’s well-being or wellness network (37.5%). Approximately one-third of Canada School of Public Service participants indicated that they heard about the pilot via social media.

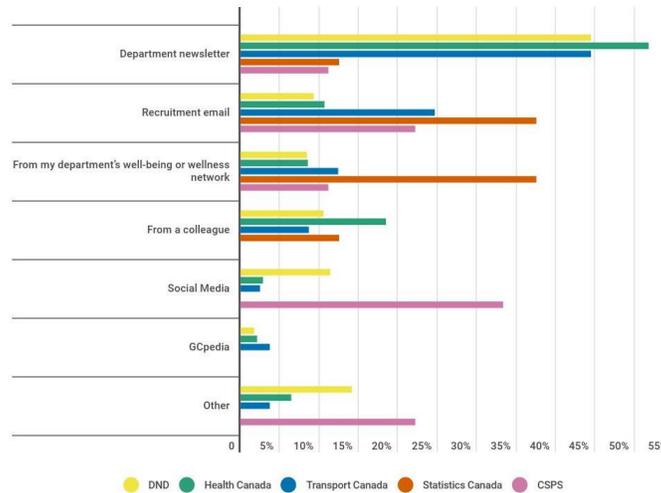


Figure 3: Percentage of participants by recruitment method by department (n = 457).

We also examined participants’ primary motivations for signing up to participate in the pilot (see Figure 4). Nearly one-fifth of participants indicated that they were already using the Carrot app when they joined the pilot. Other participants were motivated by the rewards they received for achieving their daily step goals (17.2%) or completing offers (14.7%). Similar findings emerged when we examined the proportions by department.



Figure 4: Percentages of participants’ motivations for participating in the pilot study (n = 449).⁹

⁹ Unlabeled item in Figure 4 is “other” (0.1%).

Adherence

We also examined the primary motivating factors for participants to continue to participate in the pilot study during the three month period. The most commonly reported motivating factor was “*Getting rewards points for completing offers*” (see Figure 5). This finding was consistent across all departments.

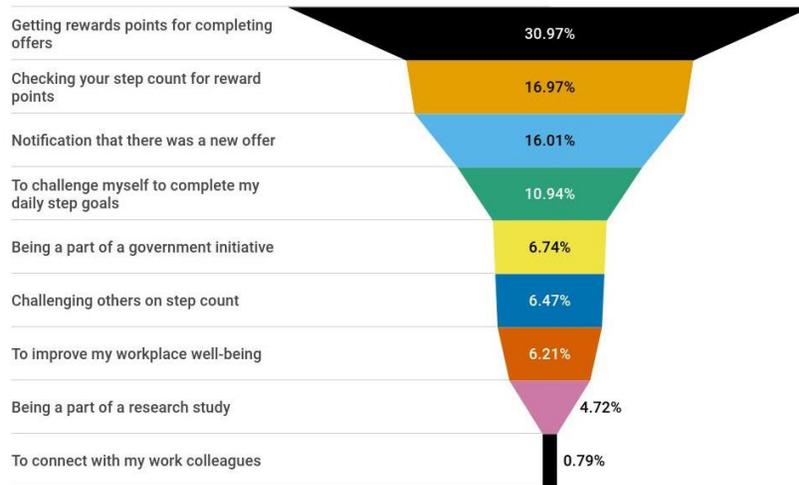


Figure 5: Percentages of participants' motivations for continued participation in the pilot study (n = 436).

Participant Feedback

Based on a dichotomous item (“Did you find that the reward points gave you enough incentive to complete the offers?” Y/N), 83.7% indicated yes. Following that item, we included the option for participants to provide additional comments. The comments were categorized based on commonly occurring themes (see Figure 6). One-quarter of the participants who provided a response indicated that they perceived the rewards as positive and/or motivating.

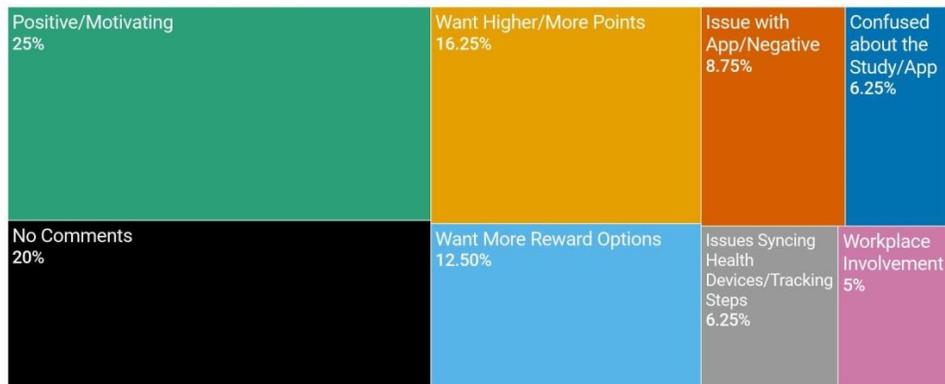


Figure 6: Commonly occurring themes for open-ended question on the incentives in the app (n = 80).

Approximately one-third (30.0%) of participants indicated that they liked some blogs, but not others (see Figure 7).

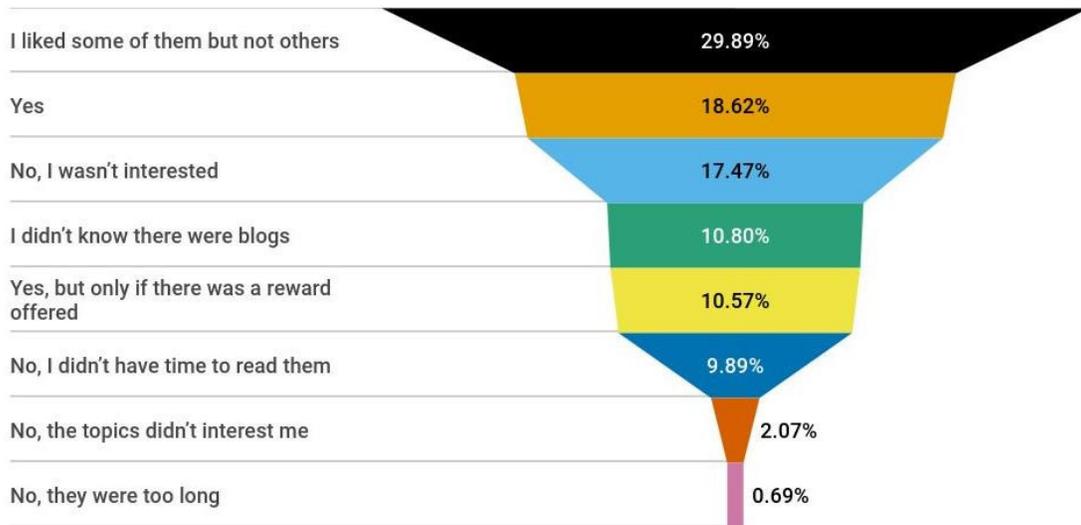


Figure 7: Proportion of participants' reported perceptions of the blog posts ($n = 435$).

Approximately one-third of participants reported that they liked some of the nudges (see Figure 8). A similar pattern emerged when we examined the proportions by department. The highest proportion of participants who reported that they did not notice the nudges came from Statistics Canada (37.5%).

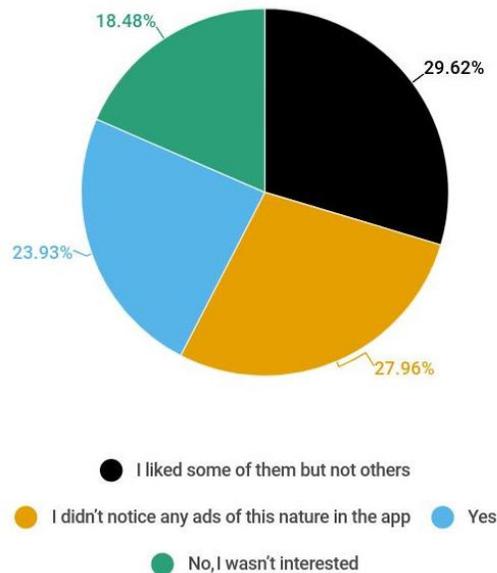


Figure 8: Proportion of participants' reported perceptions of the nudges ($n = 433$).

Discussion of Results and Future Directions

The results indicated that the majority of our end of study user experience respondents reported having a positive experience participating in the pilot. Of course, however, we anticipated that participants who remained in the pilot until the end (i.e., when the user experience survey was administered) would generally report having a positive experience. Future research should assess user experience earlier on to better understand why others cease participation. The most commonly reported recruitment method was a department newsletter; however, our results suggest some of the other recruitment strategies we employed were also effective (i.e., wellness networks and social media), but could depend on departmental network restrictions. Aside from those participants who were motivated to join the pilot because they were already using the app, we found support that the rewards participants received for achieving their daily step goals or completing offers motivated their continued participation. Our results regarding the blog posts and behavioural nudges suggest that some of the information provided left something to be desired by participants; future research should more thoroughly pilot test materials of this nature. Altogether, our findings suggest that well-being initiatives of this kind can be engaging, positive, and motivating for participants. As mentioned above, due to a randomization failure we were unable to compare participants in the experimental condition to the control condition. In addition, unfortunately step data was not available at the completion of the study; therefore we also could not draw any conclusions regarding impact on health behaviours. In considering this, future work should be aimed at conducting more rigorous scientific methods, such as randomized controlled trials, to ascertain what types of initiatives can actually improve upon workplace well-being.

Overall, the results suggest that in order to improve the relevance and accessibility of app content and the real-world applicability of its use, the feasibility of leveraging mobile apps requires careful consideration of user diversity (Chung, Gorm, Shklovski, & Munson, 2017). For example, apps that offer entirely customizable rewards, based on users' preference for vacation time or cash rewards, would take into consideration that employees across the GoC may vary in their reward and nudge preferences. Successful uptake into well-being initiatives is contingent on the selection of an existing app or design of a new app with validated design measures and customizable content, configured to the user population (e.g., see Granek et al., 2019). In order to ensure effective configuration to different populations, we propose conducting a comprehensive design of an original app tailored to GoC employees to allow for more thorough content regulation.

Here, in consideration of the literature and the scope of the current findings, in Table 1 we summarize the limitations and recommendations to be considered in future studies.

Table 1: Limitations and recommendations for user experience.

Concern	Lessons Learned	Recommendation
<i>Engagement</i>	Incentivized behaviour and convenience of use are key factors to promote engagement	Offer a variety of options for rewards and incentives; tailor options according to user preferences
<i>Adherence</i>	The type of impact nudging has on encouraging participant adherence	Consider the relevance of the nudges' content according to the target study demographic to maximize the nudges' impact
<i>Participation</i>	Rewards/points are primary motivators, challenged based tasks are secondary/supportive	Implement a broad selection of tasks/activities for participants; consider varied content and delivery of education materials (i.e., blogs/nudges)
<i>Scientific Grounding</i>	Translation of findings into practice: timing and accessibility of study content	Rigorous app selection with customizable content and timing
		Potential to design, create, and develop an original mobile app

Moreover, in order to maximize user uptake and to mitigate the potential barriers in participation of a future mobile app intervention, we suggest that information (e.g., behavioural nudges) should be customized to be delivered via notifications at the optimal time for each individual (i.e., just-in-time training; Serembus, Hunt-Kada, Lenahan & Lydon, 2019). Just-in-time training features ensure that the applications' content is readily available through on-the-go mobile or digital delivery of relevant information (Serembus et al., 2019). Further, such an intervention should allow for ongoing access to end-user experience feedback to ensure that the intervention is being monitored and can be tailored to the needs of the users (Serembus et al., 2019; Axiotis, Desiniotis & Theologou, 2007). In addition, in order to promote the systematic uptake of a similar evidence-based intervention into routine practice, it is important for these approaches to be considered through an implementation science framework (Bhattacharyya, Reeves & Zwarenstein, 2009). Implementation science is the study of translating evidence-based research findings into real world practices (Bhattacharyya et al., 2009). Abiding by this framework will aid in ensuring the appropriate use of theoretical approaches to better understand and explain how and why such an implementation succeeds or fails (Dearing & Kee, 2012). Further, similar to previous recommendations (Granek et al., 2019), in order to promote impactful change, the successful implementation of these factors is contingent on the support of leadership. The top-down reinforcement of skills will maximize organizational support from above by ensuring leadership training programs are well founded and standardized (Gilpin-Jackson & Bushe, 2007). This practice will promote long-term positive outcomes by increasing peer support, personal value and utilization of skills, and reducing costs (Gilpin-Jackson & Bushe, 2007).

Conclusion

This user experience survey was designed to provide insight into the efficacy and feasibility of factors that determine the success of mobile apps in well-being research. Our findings provide insight into how to optimize recruitment and adherence to a mobile app intervention designed to promote positive behaviour change and improve workplace relationships.

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References

- Axiotis, D. I., Desiniotis, C. & Theologou, M. E. (2007). Cellular network performance aspects of monitoring end-to-end user experience, 2007 16th IST Mobile and Wireless Communications Summit.
- Bhattacharyya, O., Reeves, S. & Zwarenstein, M. (2009). What Is Implementation Research?, *Research on Social Work Practice*, 19(5), 491–502.
- Boland, H., D'Agata, M., Granek, J. A., Nazarov, A. & Jaz, A. (2019). A reward-based approach to improve workplace well-being awareness and behaviors, Defence Research and Development Canada, External Literature, DRDC-RDDC-2019-N273, paper presented at NATO HFM—302 Symposium, Berlin, Germany.
- Chung, C., Gorm, N., Shklovski, I. A. & Munson, S. (2017). Finding the right fit, Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems —CHI 17, 4875–4886.
- Dearing, J. & Kee, K. F. (2012). Historical roots of dissemination and implementation science In R. C. Brownson, G. A. Colditz & E. K. Proctor (2nd Ed.) *Dissemination and implementation research in health translating science to practice*, 55–71, New York, NY: Oxford University Press.
- Gilpin-Jackson, Y. & Bushe, G. R. (2007). Leadership development training transfer: A case study of post-training determinants, *Journal of Management Development*, 26, 980–1004.
- Granek, J. A., Nazarov, A., D'Agata, M. T., Bae, J., Boland, H., Kirolos, R., Guest, K. & Bailey, S. (2019). Leveraging technologies to complement the Road to Mental Readiness (R2MR) training program, Defence Research and Development Canada, External Literature, DRDC-RDDC-2019-N275, paper presented at NATO HFM—302 Symposium, Berlin, Germany.
- National Defence (2017). Strong, Secure, Engaged: Canada's Defence Policy. Retrieved from: <http://dgpaapp.forces.gc.ca/en/canada-defence-policy/docs/canada-defence-policy-report.pdf> (last access: August 2019).
- Serembus, J. F., Hunt-Kada, P., Lenahan, K. & Lydon, A. (2019). Internet, apps, and tweets: Enhancing clinical learning through just-in-time training, *Nursing Education Perspectives*.

Spector, P. E. (1985). Measurement of human service staff satisfaction: Development of the job satisfaction survey, *American Journal of Community Psychology*, *13*, 693–713.

Treasury Board of Canada Secretariat (2019). About the 2019 Public Service Employee Survey. Retrieved from: <https://www.canada.ca/en/treasury-board-secretariat/services/innovation/public-service-employee-survey/2019-public-service-employee-survey-pses/about-2019-public-service-employee-survey.html> (last access: January 2020).

Treasury Board of Canada Secretariat (2016). Federal Public Service Workplace Mental Health Strategy. Retrieved from <https://www.canada.ca/en/government/publicservice/wellness-inclusion-diversity-public-service/health-wellness-public-servants/mental-health-workplace/federal-public-service-workplace-mental-health-strategy.html> (last access: January 2020).

Van den Broeck, A., Vansteenkiste, M., De Witte, H., Soenens, B. & Lens, W. (2010). Capturing autonomy, competence, and relatedness at work: Construction and initial validation of the work-related basic need satisfaction scale, *Journal of Occupational and Organizational Psychology*, *83*, 981–1002.

Annex A Items from the User Experience Survey

Overall, how would you rate your experience in this pilot?

- Very positive*
- Positive*
- Neither positive nor negative*
- Negative*
- Very negative*

How did you hear about the pilot? (select all that apply)

- A broadcast message from my department*
- An email from senior management*
- From my department's well-being or wellness network*
- From a colleague*
- Social Media*
- GCpedia*
- Other, Please explain. <Open-ended text box>*

What factor(s) motivated you to join the pilot? (select all that apply)

- I already use Carrot rewards*
- Being a part of a government initiative*
- Getting points for achieving daily step goals*
- To challenge myself to complete my daily step goals*
- Step together challenges with colleagues*
- Learning about workplace well-being*
- Getting rewards points for completing offers*
- To connect with my work colleagues*
- To improve my workplace well-being*
- Being a part of a research study*
- Other, Please explain. <Open-ended text box>*

What were the main motivating factors for you to continue using the app?

- Notification that there was a new offer*
- Getting rewards points for completing offers*
- Checking your step count for reward points*
- Challenging others on step count*
- Being a part of a government initiative*
- Being a part of a research study*
- To connect with my work colleagues*
- To improve my workplace well-being*
- To challenge myself to complete my daily step goals*
- Other, Please explain. <Open-ended text box>*

Do you have any additional comments about the rewards?

<Open-ended text box>

Did you like the blogs?

Yes

Yes, but only if there was a reward offered

I liked some of them but not others

No, I wasn't interested

I didn't know there were blogs

No, I didn't have time to read them

No, they were too long

No, the topics didn't interest me

Did you like the nudges?

Yes

I liked some of them but not others

No, I wasn't interested

I didn't notice any ads of this nature in the app

No, I felt like there were barriers to the suggested behaviours

No, I felt like they weren't behaviours I would like to engage in

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