

Public Service Employee Survey (PSES)

Using Advanced Analytics to Inform Action Plans

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BLUF

Bottom Line Up Front



There are hidden relationships in the PSES data that are not revealed by traditional PSES reports and dashboards



Advanced analytics can help to diagnose the root causes of certain PSES results and generate actionable insights

Analytics can also accelerate the development of action plans, while reducing bias and subjectivity in recommendations



“Stress & Well-Being” is the central theme of PSES results

Several factors are influencing it and their relative importance can be estimated

BACKGROUND



Several tools already exist within the GoC for PSES analysis

- Various levels of sophistication, from basic spreadsheets to interactive dashboards
- Generally focused on data exploration and purely descriptive statistics (“what has happened?”)
- No real capability for diagnostic analytics (“why did it happen?”)



Many DND branches have expressed requirements for new analytics to better interpret and visualize PSES results

- Analytics is a pillar of the PSES Way Forward led by ADM(HR-Civ) and ADM(RS)
- ADM(DIA) has been exploring new, cutting-edge analytics tools to analyze PSES data, supported by ADM(S&T), NRC, and industry

BACKGROUND (CONT'D)



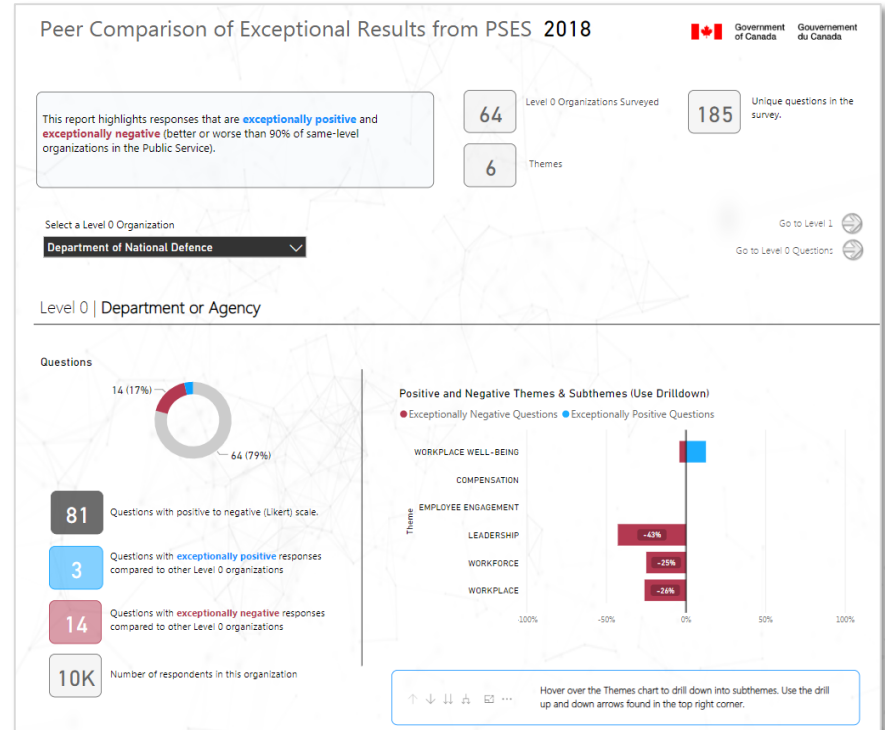
In 2019, ADM(DIA) developed a first PowerBI tool for peer-comparisons of PSES results

- Helps to rapidly identify where an organisation is better (or worse) than 90% of same-level orgs in the Public Service
- Many DND organisations engaged during development



Additional requirements raised for diagnostic analytics

- What is **causing** certain results?
- Can we generate **actionable insights** using more advanced techniques?



DND-NRC PROJECT ON PSES ANALYTICS



Period: from Oct 2019 to Mar 2020



Goal: explore how advanced analytics can generate new and actionable insights from PSES results, to better inform action plans



Four **specific objectives:**

01.

Explore how advanced statistical techniques could help identify the **root causes** of certain PSES results

02.

Determine how statistically significant **temporal changes** in the PSES results could be more easily identified

03.

Explore how **additional datasets** (e.g., data on compensation issues) could complement PSES data and provide new insights

04.

Assess how **artificial intelligence** could help summarize PSES results in text form, through Natural Language Generation

The following slides focus on this portion of the project

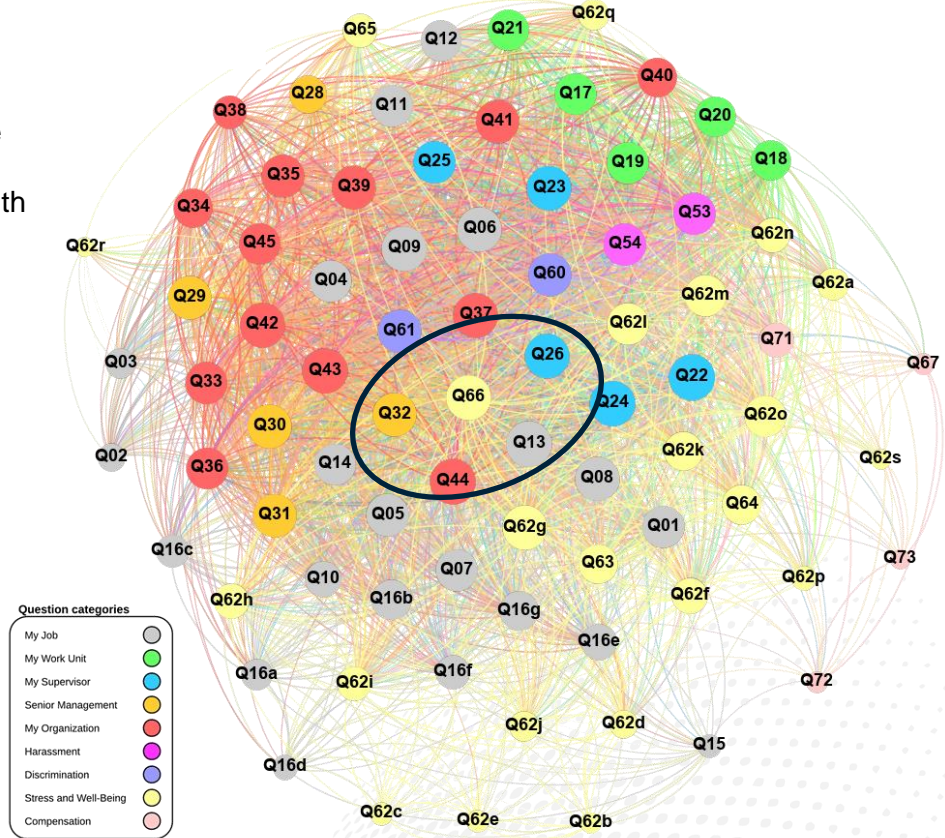
PSES RESPONSES ARE CORRELATED

- Many of the responses to different PSES questions are correlated with each other
- Questions that are most highly connected/correlated with others are seen in the **centre** of this graph

EXAMPLE

Some **central** questions...

- Q66** – My workplace is psychologically healthy
- Q44** – I am satisfied with my department or agency
- Q26** – I am satisfied with the quality of supervision I receive
- Q32** – Essential information flows effectively from senior management to staff



VISUALIZING CAUSAL EFFECTS

- We can **estimate** which responses influence other responses, and by how much, using causal graphs
- Edge **width** represents the estimated effect magnitude
- Edge **direction** shows the direction of the causal effect

EXAMPLE

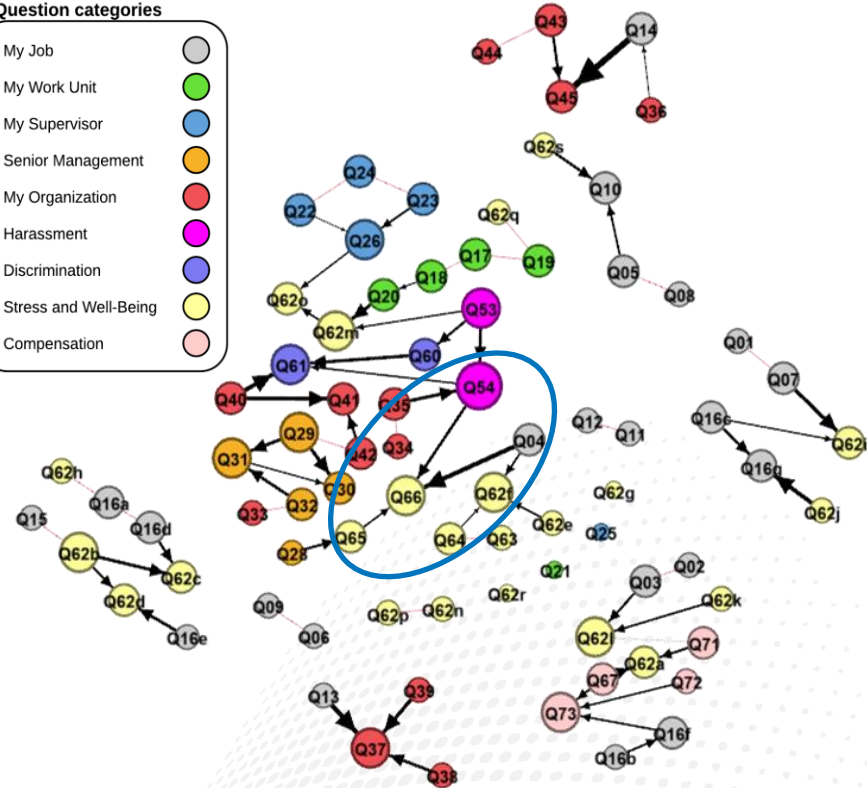
Stress & well-being

- Q66** – my workplace is **psychologically healthy**
- Q65** – My department does a good job of raising **awareness of mental health** in the workplace
- Q04** – I have support at work to **balance** my work and personal life
- Q54** – My department works hard to create a workplace that prevents **harassment**

Q54 → Q66
Q65 → Q66
Q04 → Q66
(cause → effect)

Question categories

My Job	Grey
My Work Unit	Green
My Supervisor	Blue
Senior Management	Orange
My Organization	Red
Harassment	Pink
Discrimination	Purple
Stress and Well-Being	Yellow
Compensation	Light Pink



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EXAMPLE

Compensation

Q73 – To what extent have issues with the Phoenix pay system affected your decision **to seek or accept another position** within your organization or the public service?

Q67 – To what extent has your **pay** or other compensation been affected by issues with the **Phoenix** pay system?

Q72 – I am satisfied with the support I received from the **Pay Centre** to help resolve my pay / compensation issues

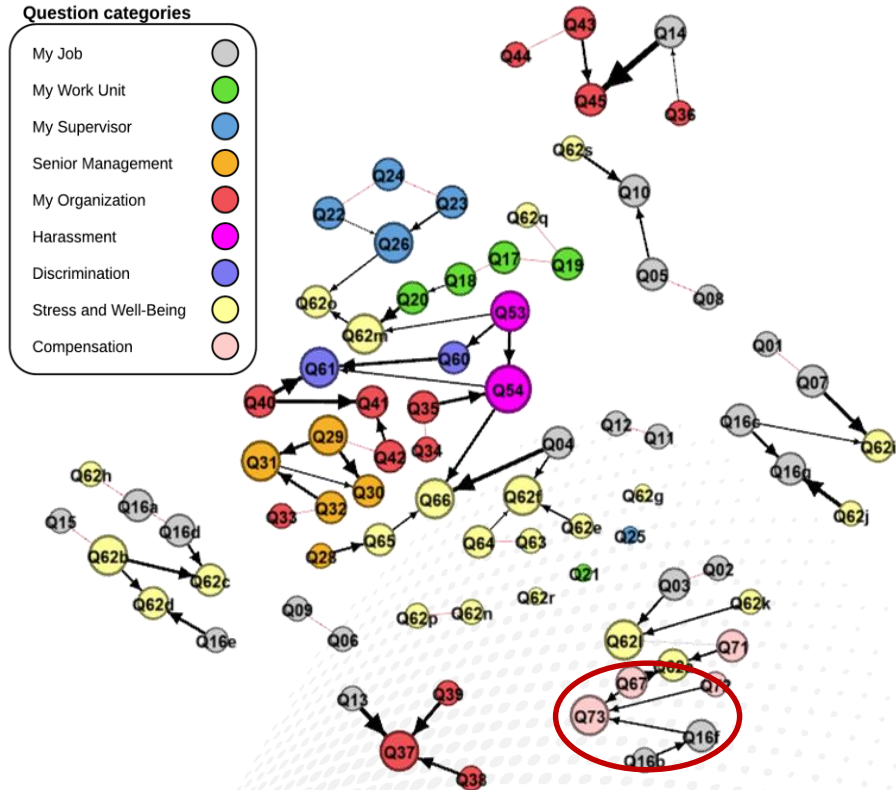
Q16f – I feel that the **quality** of my **work** suffers because of high staff turnover

Q67 → **Q73**

Q72 → **Q73**

Q16f → **Q73**

(**cause** → **effect**)



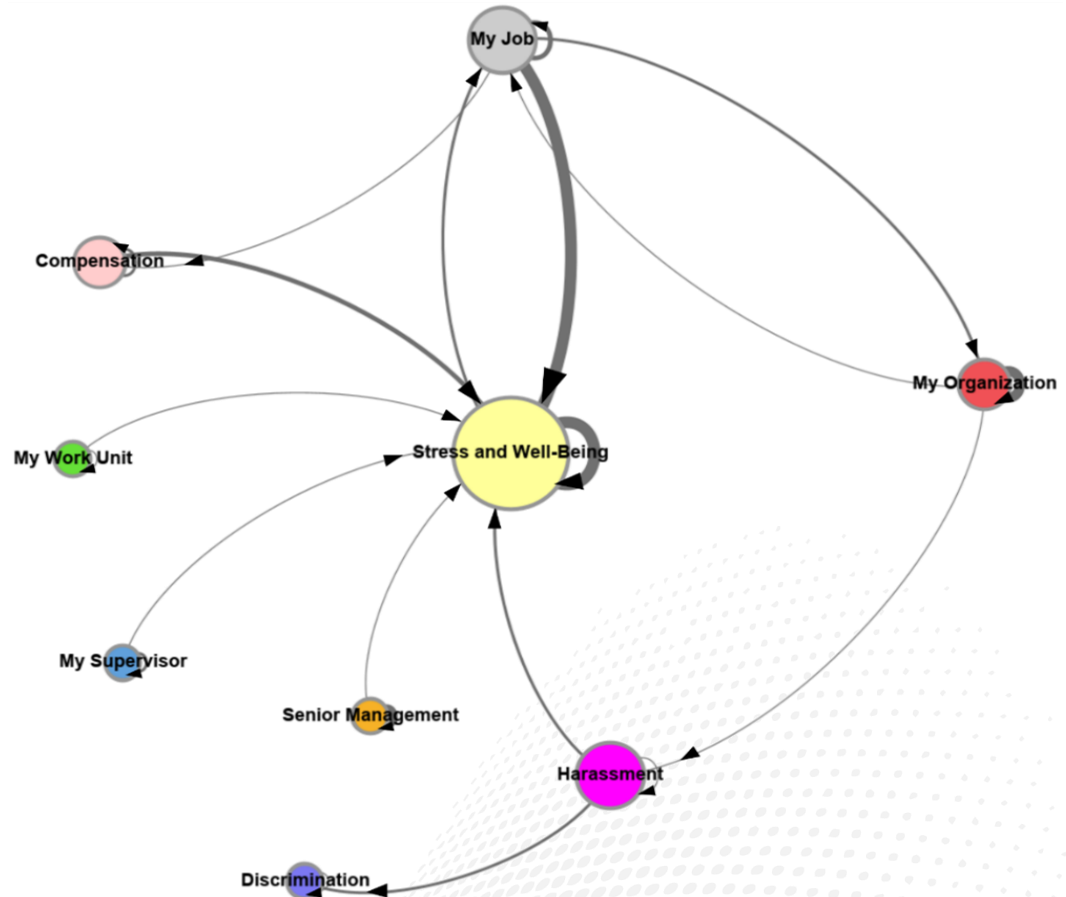
“STRESS & WELL-BEING” IS THE CENTRAL THEME

- We can also estimate which PSES themes influence other themes, and by how much



Some observations

- Most other themes have a statistically significant effect on “Stress & Well-Being”
- “My job” is the main influencer, followed by “Compensation”
- Self-loops appear because of correlated questions within themes

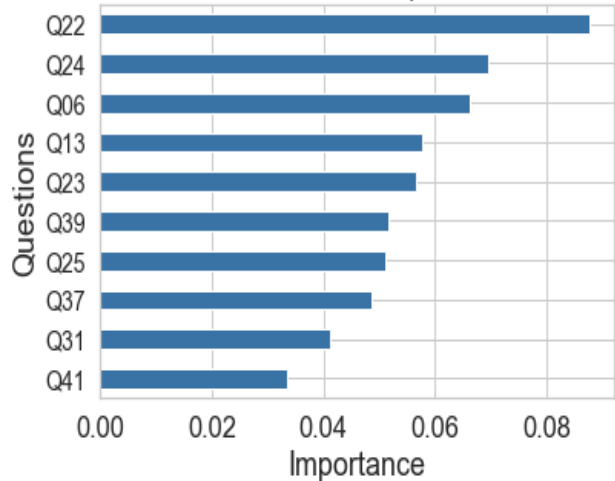


KEY INFLUENCERS TO CONSIDER IN ACTION PLANS

- Using machine learning, we can identify and rank the factors influencing the score obtained to any specific question.

EXAMPLE

Top 10 influencers of Q26 – I am satisfied with the quality of supervision I receive



- Q22.** I receive useful feedback from my supervisor on my job performance.
- Q24.** My Supervisor keeps me informed about issues affecting my work.
- Q06.** I receive meaningful recognition for work well done.
- Q13.** I have support at work to provide a high level of service.
- Q23.** I can count on my supervisor to keep his/her promise.
- Q39.** I feel I would be supported by my department if I proposed a new idea.
- Q25.** My supervisor seems to care about me as a person.
- Q37.** My department does a good job of supporting employee career development.
- Q31.** Senior management in my department makes effective and timely decisions.
- Q41.** I think my department respects individual differences.

Ranking offers insights on priority areas to consider for improving satisfaction (feedback, comms, recognition, etc.)

SUMMARY



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WAY AHEAD



Prototype dashboards will need to be further developed to meet the needs of PSES stakeholders, in DND and across the Public Service

- In DND, they would simplify and accelerate the development of PSES action plans, while reducing bias and subjectivity in recommendation
- Central agencies could use the same dashboards to get a clearer picture of the Public Service as a whole and inform new employee-related policies
- Initial discussions with PCO's **Beyond 2020** team suggest that there is a lot of potential for these analytics to inform public service renewal initiatives. Different avenues for exploitation are being explored.