FINAL ASSESSMENT REPORT

Institutional Quality Assurance Program (IQAP) Review

PSYCHOLOGY, NEUROSCIENCE & BEHAVIOUR (UG) PROGRAM

Date of Review: April 18 – 19, 2023

In accordance with the University Institutional Quality Assurance Process (IQAP), this final assessment report provides a synthesis of the external evaluation and the internal response, and assessments of the undergraduate program delivered by the Psychology, Neuroscience & Behaviour program. This report identifies the significant strengths of the program, together with opportunities for program improvement and enhancement, and it sets out and prioritizes the recommendations that have been selected for implementation.

The report includes an Implementation Plan that identifies who will be responsible for approving the recommendations set out in the Final Assessment Report; who will be responsible for providing any resources entailed by those recommendations; any changes in organization, policy or governance that will be necessary to meet the recommendations and who will be responsible for acting on those recommendations; and timelines for acting on and monitoring the implementation of those recommendations.

Executive Summary of the Review

In accordance with the Institutional Quality Assurance Process (IQAP), the Faculty of Science submitted a self-study in January 2023 to the Vice-Provost (Teaching and Learning) to initiate the cyclical program review of the Psychology, Neuroscience & Behaviour undergraduate program. The approved self-study presented program descriptions, learning outcomes, and analyses of data provided by the Office of Institutional Research and Analysis.

Two arm's length external reviewers and one internal reviewer were endorsed by the Dean, Faculty of Science and selected by the Vice-Provost (Teaching and Learning). The review team reviewed the self-study documentation and then conducted an in-person site visit on April 18 – 19, 2023. The visit included interviews with the Vice-Provost (Teaching and Learning), Deputy Provost, Deans of the Faculty of Science and Faculty of Social Sciences, Chair and Associate Chair of the program, Assistant Deans of both Faculties, and meetings with groups of current students, full-time faculty, and support staff.

The Deans of the Faculty of Science and Faculty of Social Sciences, and Chair and Associate Chair of the PNB undergraduate program submitted responses to the Reviewers' Report. The initial response was prepared by the program in June 2023 and finalized by the Dean in May 2024. Specific recommendations were discussed, and clarifications and corrections were presented. Follow-up actions and timelines were included.

- **Strengths**
  - **Programs**
    - Our honours programs – particularly the Neuroscience and BioPNB programs, and the PNB Music Cognition Specialization – are impressively interdisciplinary.
    - Our department honours its commitment to research training in the PNB and Neuroscience programs by offering skills-based courses and many opportunities for students to participate in research. Graduates from the PNB and Neuroscience programs are well prepared for research-oriented graduate programs.
    - Our Applied Psychology in Human Behaviour Specializations, which are jointly offered with Mohawk College, prepare students for employment immediately after graduation.
    - The 'cascades of knowledge' model is a creative way to use resources.
  - **Student experience**
    - Our first-year courses exemplify blended learning at its best.
    - Students in our limited enrolment programs have a strong sense of cohort, supported in part by professional development training provided in non-credit tutorial courses (PNB 2XT0, NEUROSCI 2XN0).
    - PNB faculty are passionate about their programs and want the best for students.

- **Opportunities for improvement and enhancement, including appropriateness of resources**
  - PNB should develop an improved process for (1) student-faculty matching in independent research courses and (2) enrolment in lab courses, that provide equitable access to all students. Our current process is labour-intensive and error-prone, and one solution (at least for lab course enrolment) might involve the adoption of software like Course Match (which is used at the University of Toronto).
  - PNB should cap the Applied Psychology in Human Behaviour program and create an open Psychological Science program (see below).
  - We aim to hire more faculty in order to bring PNB's student-to-faculty ratios in better alignment with other departments in the Faculty of Science.
  - PNB should consider updating the uses of physical spaces, including the current computer lab.
  - We should consider removing some prerequisites for under-enrolled programs, like the PNB Music Cognition Specialization.
  - We are working to improve communication between students, staff and faculty in PNB, as well as between PNB and other departments and the administration.

Recommendation #1: Cap Applied Psychology of Human Behaviour (general) enrolment to 40 students/year.
Department's Response: We agree that the Applied Psychology in Human Behaviour (general) program should be capped at 40 students/year. **Actions to be Taken:** Our Associate Chair (Undergraduate) will bring a proposal to the Faculty of Science Academic Planning & Policy Committee (AP&PC) and to the Faculty of Social Sciences Undergraduate Academic Planning & Policy Committee (UAP&PC) to add a note in the academic calendar that states, "E**nrolment in this program is limited and possession of the published minimum requirements does not guarantee admission.** Selection is based on academic achievement but requires, as a minimum, completion of any Level I program with a Grade Point Average of at least 5.0 including at least a grade of C+ in both PSYCH 1X03 (or 1F03) and PSYCH 1XX3 (or 1FF3).**"** In the Faculty of Science, approval of this proposal will be contingent on PNB opening another program. Given that we have a significant amount of work to do to revive the Psychological Science program (see recommendation #2), we may not be able to bring this proposal to AP&PC in Fall 2023. In the interim, we will work collaboratively with the Faculty of Science to monitor enrolment in the Applied Psychology in Human Behaviour (generalist) program and enact contingency plans, if necessary (see recommendation #4).
Dean's Response: The Faculty of Science recognizes the challenges that have come with the increased enrolment in the Honours Applied Psychology of Human Behaviour program. These are challenges that have been similarly faced by other open enrolment programs in the Faculty of Science. In the case of this program, this is an indication that students are inclined towards programs that are offered by the PNB Department. Unlike other open enrolment programs in Science, and as noted by the IQAP reviewers, a large majority of the students enrolled in the Applied Psychology and Human Behaviour program are transfers from the Faculty of Social Sciences. The Deans of the Faculty of Science and Social Sciences have shared with the Department that they feel it would be pre-emptive to fully cap the Applied Psychology of Human Behaviour program without a concrete plan going forward. The Department will, however, work with the Deans and make a plan towards capping the Honours Bachelor Applied Psychology in Human Behaviour, which should reduce the number of Social Science students transferring into this program. Further, both Faculties jointly, do not support the proposed Psychological Science program. The details of that program were not provided to the Faculties as part of the IQAP self-study or in advance of being shared with the IQAP reviewers and there are a number of issues we have identified. Specifically, there are serious concerns with the proposal to revive the Honours Bachelor of Science (HBSc) in Psychological Science or the use of that program as the basis to undertake a new program proposal. As presented, this program has little to no applied or experiential learning opportunities. With that, the greatest concern is that graduating students would be at a significant disadvantage in their post-graduate paths, especially when compared to students in other PNB programs or at competing institutions.

Recommendation #2: Revive HBSc in Psychological Science as an open-enrolment program that is designed to accommodate enrolment fluctuations.
Department's Response: We are exploring the possibility of reviving a version of the Psychology (Core) program that our department offered before the PNB programs were created. The Psychology program would be designed to accommodate large numbers of students and fluctuations in enrolment, and would satisfy the Faculty of Science policy that each Department offer an unlimited enrolment program. The reviewers recommended removing the lab requirement from the open enrolment program, or minimally, requiring a lab course that can accommodate large numbers of students. We feel strongly that the lab requirement should be retained so that students have some practice with experimental design, data collection, and data interpretation. We envision a course in which human psychology experiments are performed either during lecture with large groups of students, or during weekly tutorials under the guidance of a TA. The lab course would not require a designated wet lab space. **Actions to be Taken:** In the coming months, our Associate Chair (Undergraduate) and the Chair of the Open Enrolment Program Development Committee will consult extensively within PNB (e.g., with students), the Faculty of Science (e.g., with the Dean, Associate Dean, and other members of AP&PC), and more broadly (e.g., with the Faculty of Social Sciences) in order to gauge student interest in a Psychology program, to establish the feasibility of such a program, and to gather feedback from other units that may be impacted by the new program. With the help of Educational Developers from the MacPherson Institute, we'll navigate the process for resurrecting our old Psychology (Core) program. Alternately, we may be required to start the IQAP process for new program proposals. If we are able to resurrect our old program, our Associate Chair (Undergraduate) will bring a proposal to AP&PC to add the new HBSc in Psychological Science to the 2024-2025 academic calendar. Importantly, enrolment in the Psychological Science program should be capped in 2024-2025 so that we do not have two unlimited enrolment programs being offered simultaneously.
Dean's Response: As articulated in response to Recommendation #2, both Faculties do not support the proposed Psychological Science program, or the use of that program as the basis to undertake a new program proposal. Building off Recommendation #16, there is a need for improved communications between the Faculty of Science and Social Sciences as it relates to the parallel programs that are offered by both Faculties. Since September 2023 we have created a Joint Curriculum Advisory Committee which both Faculties agree will be able to consider creative and tangible ways to proceed. This could include, for example, revisiting the existing Honours PNB BA program to infuse more social science courses, or altering the Level 1 prerequisites for the Applied Psychology of Human Behaviour program to be more Science-focused, both of which would reduce enrolment in the Applied Psychology and Human Behaviour over time. Several options to address the fundamental concern raised by the reviewers are being considered and will need to be advanced in a careful way that does not negatively impact either the students or the resourcing available to the Faculties of Science and Social Sciences and the Department of PNB.

Recommendation #3: Funding is required for new CLA lines to manage temporary increases in enrolment when transitioning open programs from Human Behaviour or Psychological Sciences.
Department's Response: We anticipate that our enrolment numbers will be very high during the transition between the old and new unlimited enrolment programs. At that time, our biggest challenge will be to provide 6 units of capstone experience to the Applied Psychology in Human Behaviour (generalist) students, as per their degree requirements. We will also be launching 15 units of new teaching as part of the Psychological Science program curriculum, including a 3-unit statistics and computing course, a 3-unit reading and writing course, a 3-unit lab course, and a 6-unit perspectives capstone experience. **Actions to be Taken:** We will require the support of at least one CLA (18 units of teaching) for approximately 3 years to manage the transition between open programs.
Dean's Response: This specific recommendation will not be considered at the moment as the Faculties do not support moving forward with the Psychological Sciences Program (or a version of this program), however a CLA renewal request from the department has been approved for the 2024/25 academic year.

Recommendation #4: The Department and Dean's office should collaboratively develop a plan to monitor enrolment numbers along with contingency plans in case they exceed mutually agreed benchmarks.
Department's Response: We strongly support this recommendation. The Faculty of Science implemented an unlimited enrolment policy in the 2014-2019 Academic Plan; however, the impacts of the policy on students and academic units have not been evaluated. Together with colleagues from the Faculty of Science, we would be happy to co-develop a process to evaluate whether the policy is achieving its desired goals. We'd also like to develop a plan to monitor enrolment numbers in our new unlimited program (as well as in other unlimited programs in Science), and to develop contingency plans so that departments can thoughtfully and reasonably plan their academic curricula. **Actions to be Taken:** Our Associate Chair (Undergraduate) will suggest to AP&PC that a committee is struck to refine the unlimited enrolment policy, to develop benchmarks, and to develop contingency plans if benchmarks are exceeded.
Dean's Response: The 2014 need to create at least one open enrolment program in each Department in the Faculty of Science was spurred by a variety of factors including the desire to limit enrolment in companion programs in each Departments/Schools, to also provide all students who enter the Faculty of Science through a Level 1 gateway with the possibility of entering a level 2 program closely matched to their disciplinary area of choice and to enable matching of resourcing with Departmental demands. These limited enrolment caps are in place in many cases due to resource-related challenges (e.g. lab space restrictions, limits on potential thesis/project supervisors etc.). Without the presence of open enrolment programs, the Faculty would be in a grave risk of not being able to place a large proportion of students within their programs of choice (or a version of their programs of

choice). Up to 2014, this resulted in many Level 1 Science students being placed by default into an unsustainably large generalist Life Sciences program. Given these challenges the Faculty asked all Departments/Schools to also create open versions of at least one of their BSc programs. We recognize that the decision of PNB to open the applied BASc program has led in itself to challenges related to students being able to secure placements within the program but believe that there may be other creative ways forward to help with these challenges.

The Faculty of Social Sciences has expressed concerns regarding the Faculty of Science's open enrollment policy, which has generated a high number of Social Science student transfers into the Honours Applied Psychology in Human Behaviour program. The Faculty of Social Sciences thus seeks to mitigate the transfer of Social Sciences students into this program and is working with the joint committee to address these concerns.

We disagree with the Departmental characterization that the have been no evaluations of the impacts of this policy on students and academic units. Rather, since 2015 the Faculty of Science has collected standardized and verified annual benchmark data that has been available to all members of the Faculty. This data has been extensively utilized in many strategic processes in the Faculty of Science, including the Faculty Appointments Advisory Committee, and the Faculty Finance Committee and in our submissions to the Enrollment Management Committee. Further this information has informed the strategic plan for the Faculty of Science wherein there are several strategic priorities linked to the utilization of this data. We regularly ask Departments to consider the implications of the enrolment in their programs as they contemplate their academic curriculum planning and submissions, their submissions to the Faculty Appointments Advisory Committee and the submission of their annual budgets.

The Faculties have encouraged the Department to revisit their BA Psychology and Honours PNB Programs (BA and BSc programs), and consider approaches taken by other Departments that have succeeded in creating Core versions of their limited enrolment Research Specializations, as a means of handling increased pressures around enrolment and placement/capstone thesis or project requirements. Similarly, we have seen other Departments effectively monitor their program enrolments and tailor their plans and requests to the enrolment requirements. In this fashion, a limited enrolment PNB Specialization could continue as a program that provides an excellent experience for research-inclined students, while a Core program would enable students to still pursue a version of the Specialization that is less applied/research intensive. This would still give Core students the benefit of being enrolled in a version of a high-quality program and could lead to better post-graduate successes than if they were enrolled in the proposed new Psychological Science program. This can be a consideration for the Department and the Joint Curriculum Advisory Committee to further discuss.

Recommendation #5: Consider Closing the Mental Health Specialization of PNB (BSc and BA)

Department's Response: We agree that the PNB Mental Health Specialization (BSc and BA) should be closed. We do not have the resources to provide students with the clinical courses and practical experience that they desire.

Students are attracted to this program because they aspire to pursue clinical psychology, and the students expect this to be a pre-clinical program. However, as students progress through the program

they become disappointed by the lack of clinical opportunities. We don't think it's fair to students to offer a program that is not doing what it was originally intended to do.

Actions to be Taken: In Fall 2023, the Associate Chair (Undergraduate) will bring a proposal to AP&PC and UAP&PC that the PNB Mental Health Specialization (BSc and BA) be closed as of 2024-2025.

Dean's Response: The Faculties recognize the challenges imposed by the retirement of Dr. Geoffrey Hall but asked the Joint Curriculum Advisory Committee to further discuss a possible course of action. The Joint Committee has since met and concurs with this recommendation to close the PNB Mental Health Specializations (BSc and BA). The Deans have expressed that we support the closure, provided that an additional 15 extra seats are added into each of the BA and BSc Honours PNB programs as suggested by the External Reviewers. This change is now progressing through the Governance approval process.

Recommendation #6: Increase enrolment in Music and Cognition Specialization of PNB to better align with new hires, for example, by restructuring enrolment requirements, considering direct entry options, and improving the early promotion of the program through social media and other advertising.

Department's Response: Enrolment in the PNB Music Cognition Specialization (BA and BSc) has consistently been below target levels. Given our department's expertise in music cognition and our association with the McMaster Institute for Music and the Mind (MIMM), we are keen to increase enrolment in the PNB Music Cognition Specialization.

Actions to be Taken: We will create a Music Cognition Steering Committee (see recommendation #16) (Drs. Trainor, Brown, Fink, Iverson and a member(s) from the School of the Arts) with the goal of (a) increasing awareness of the PNB Music Cognition program in high school and in level I Science and Humanities, (b) reviewing the program admission requirements and program requirements with the aim of reducing barriers to program entry, (c) improving communication between PNB and the School of the Arts. The Steering Committee will also be responsible for reviewing program requirements on an annual basis.

In the short term, we have some ideas to increase awareness of the program. The Associate Chair (Undergraduate) will promote the program during her "engaging lecture" in SCIENCE 1A03, which is a large level I Fall course that introduces students to the units in the Faculty of Science. We will also advertise the program in our IntroPsych courses, particularly during the audition module in PSYCH 1XX3. Finally, we'll connect with the School of the Arts to request that they promote the program to students taking MUSIC 1A03 and MUSIC 1AA3.

As a longer-term solution to growth in the PNB Music Cognition Specialization, the Steering Committee will also consider the possibility of making the program direct entry. The program would be more visible to high school students as a direct entry program. By having a common first year, we could ensure that our PNB Music Cognition students take the required courses to prepare them for level II and beyond.

Dean's Response: The Faculty supports the creation of a Music Cognition Steering Committee, that is supported by the PNB Associate Chair, Undergraduate. We are not yet certain of the feasibility

related to a level 1 direct entry program, but our Office of the Associate Dean, Undergraduate Studies will be able to support these conversations.

Recommendation #7: Consider removing some prerequisites for the Neuroscience program.

Department's Response: The department does not have a plan to expand the Neuroscience program in the near future. Although the prerequisites limit access to the program in level II, we feel that the prerequisites are appropriate given the program learning outcomes (as the reviewers point out). Students who are less interested in the physical sciences can pursue neuroscience through the PNB program, which has fewer math and physics requirements.

Importantly, the interdisciplinary Neuroscience program relies heavily on courses offered by other departments (e.g., COMPSCI 1M03, PHYSICS 2B03, BIOLOGY 3PO3). This was one consideration when deciding on the small size of the Neuroscience program: the larger our cohort, the more difficult it becomes for other departments to accommodate our students in their courses.

One bottleneck to expanding the Neuroscience program is the required lab course. Currently, students work in groups of 4 at one of the 6 electrophysiology rigs. This arrangement is not ideal; each student gets less than 45 minutes of hands-on time during a 3-hr lab. Increasing the lab capacity can only work if we offer multiple lab sections, and this would require more qualified TAs or IAs to run the various lab sections, as well as dedicated time from our lab technician to oversee labs.

Finally, growth in the Neuroscience program requires more research faculty. PNB neuroscientists are inundated with requests from students who want to work in their labs. Owing to the technical nature of the work and the amount of training required, each neuroscience faculty member can typically take only 1-2 thesis students per year. This, combined with the fact that several prominent neuroscientists have recently retired or left McMaster (Drs. Nurse, Jacobs, O'Donnell, Scott), means that the number of research opportunities for neuroscience students is currently severely limited.

Actions to be Taken: We do not plan to remove prerequisites at this time; however, we will improve our communication with level I students to increase awareness about the program prerequisites. We will focus our effort on the Fall term by attending the term 1 What to do in Level II program fair and delivering the "engaging lecture" in SCIENCE 1A03.

Dean's Response: The Faculty supports the current hold on enrolment for the Level 2 Neuroscience program but encourages the Department to consider creative approaches that could facilitate future growth of the program. Especially if new faculty are eventually hired with the appropriate subject matter expertise. In the interim, the Office of the Associate Dean, Undergraduate Studies is committed to helping support the Department with increasing awareness regarding program prerequisites.

Recommendation #8: Improve course timetabling of PNB level II courses.

Department's Response: Based on discussions with PNB students, the reviewers suggested that we swap the level II writing course (PNB 2XD3) with one of the Fall content courses. The students' feedback has prompted us to re-evaluate the scheduling of PNB level II courses. There are several factors to consider.

1. The three "content" courses (PNB 2XA3, 2XB3, 2XC3) are intentionally scheduled for the Fall term so that students can use this foundational knowledge in the Winter skills courses. For example, in PNB 2XD3 - Integrative PNB Through Scientific Writing, students are expected to integrate themes across psychology, neuroscience and animal behaviour in scientific writing exercises.
2. PNB 2XD3 is supported by peer mentors who enrol in PNB 3XD3 – Integrative Mentor: Learning to Write Through Student Editing. PNB 3XD3 intentionally begins in the Fall term so that peer mentors are trained before the writing course begins in Winter.

For these reasons, the writing course needs to be offered in the Fall term.

The reviewers also suggested that we offer our "content-heavy classes during the day, when students are best able to learn." However, cognition research shows that younger adults perform better on tasks of memory and attention in the afternoon/evening (e.g., Iskander S et al., 2016). Moreover, research suggests that learning depends on whether instructional time matches a student's time-of-day preference (i.e., their chronotype) (May CP, Hasher, L & ER Stoltzfus, 1993). Therefore, while some of the students involved in the IQAP discussions may have been morning learners, their preferences may not represent the entire PNB cohort.

Iskandar S, Murphy KJ, Baird AD, West R, Armilio M, Craik FI, & Stuss DT. (2016) Interacting effects of age and time of day on verbal fluency performance and intraindividual variability. *Neuropsychol Dev Cogn B Aging Neuropsychol Cogn,* 23(1):1-17.

May CP, Hasher L, & Stoltzfus ER. (1993). Optimal time of day and the magnitude of age differences in memory. *Psychological Science*, *4*(5), 326-330.

Actions to be Taken: This recommendation has brought to our attention a need to review the level II PNB skills courses to ensure that they are achieving their desired learning outcomes. PNB 2XD3, 2XE3, and 2XF3 have had quite a bit of instructional turnover in the past few years, so the original intention that these courses integrate PNB content may not be well known. The Associate Chair (Undergraduate) will meet with each of the instructors to ensure that PNB 2XD3, 2XE3 and 2XF3 are meeting their intended learning outcomes.

Regarding time-of-day, we will do a more fulsome survey of our PNB students to investigate whether evening classes are a problem.

Dean's Response: The Office of the Associate Dean, Undergraduate Studies will be able to support any change in course scheduling, while considering if there may be any potential impacts on other course offerings both within and outside of the Department. The Faculty encourages the department to consider a balance in time of day for course offerings and is encouraged to see that a survey of current PNB student will be deployed to help with making the most informed decision on course scheduling. Moving away from the scheduling of too many evening courses may be advantageous for students who need to engage in part-time employment in the evenings to be able to help support their studies or those students who engage in extra and co-curricular activities in the evenings.

Recommendation #9: Streamline systems for equitable research course opportunities.

Department's Response: We agree that our current system for obtaining research opportunities (lab course, independent research, thesis) can be confusing, error-prone, and inequitable. We've discussed this issue at several recent faculty meetings, and we are committed to improving the process so that it works better for faculty, staff, and most importantly, for students.

Actions to be Taken: We plan to implement several changes beginning in 2023-2024.

1. The Associate Chair (Undergraduate) is working with several teaching staff to improve our departmental website. One of the goals is to provide more clarity and information regarding the process for obtaining research opportunities in **all** our programs. Another goal is to highlight other experiential learning opportunities that are available in PNB and at McMaster, so that students can pursue an experience that is aligned with their career path and they don't feel compelled to complete a thesis. (Note that, with the exception of the BioPNB program, none of our Honours programs require a thesis for graduation.) Our enhanced website will include information about curricular experiential opportunities (e.g., peer mentoring, internships and placements, community engagement courses), co-curricular opportunities (e.g., community outreach), and employment opportunities (e.g., undergraduate TAships, NSERC USRAs, Work Study positions).
2. Information about research opportunities will also be communicated to students in required level II courses (PNB 2XT0, NEUROSCI 2XN0, HUMBEHV 2AP3).
3. We will implement a new thesis application process based on a model established by the Department of Biology. We have an approximate timeline (see below) but have not worked out the details.
    I. By October 6, level III students will indicate their interest in completing a thesis by submitting a Letter of Intent. In the Letter, students will indicate their preferred three supervisors and provide a brief statement of interest. They'll attach their CV and unofficial transcript.
    II. From mid-October to the end of December, PNB faculty will have the opportunity to interview prospective thesis students.
    III. All faculty will be required to make thesis offers by January 31st. This timeline is a bit later than Biology's because we feel it is helpful to have data from term 1 of level III (e.g., grades, final projects) when making student selections. Students who are not matched with a supervisor will have the opportunity to interview with additional faculty.
4. The application procedure for independent library studies and independent research projects will be decoupled from the thesis application process. Students seeking to complete independent research will be required to submit a form to the Academic Advisor one month in advance of the start of term. For example, a student seeking to complete PNB 3QQ3 in January will be required to submit the form by December 1st. The same procedure will apply to students in **all** programs.
5. To increase the number of students who have access to laboratory courses, students will only be allowed to enrol in one lab course during the enrolment period. One way to accomplish this is to add a note in the Academic Calendar indicating that students can only take 3 units from the lab course list.

Dean's Response: The Department has done a great job at updating the Departmental website with information related to the various types of research opportunities, and how to secure them. The newly implemented thesis application process is aligned with that of the Department of Biology, which will make the timelines aligned for students who are enrolled in interdisciplinary/collaborative programs between both units (e.g. Neuroscience and Biology & PNB). We would also like to highlight the establishment of the Office of Undergraduate Research in the Faculty of Science with a mandate to support undergraduate research endeavours and activities. It will be important for the Department to stay connected with developments and activities in that office that might support the response to this recommendation.

Recommendation #10: Provide More Structure for the Neuroscience Thesis Course.

Department's Response: We agree that Neuroscience students would benefit from in-class instruction to support their thesis experience.

Actions to be Taken: The Neuroscience Steering Committee will explore several solutions.

One solution is to embed instruction into the Neuroscience Seminar (NEUROSCI 4S03). The Seminar is a full-year course and there is flexibility to offer classes related to grad school applications, thesis writing, document formatting, and presentation, for example.

Another solution is to enroll Neuroscience students in the Biology thesis course, since the culminating event for Neuroscience thesis students is the Biology Undergraduate Symposium (BUS).

Dean's Response: The Faculty encourages the Department to explore a plan that ensures that all thesis students in PNB are able to attain the best possible support and guidance throughout their thesis experience. For the Neuroscience students, it may make sense to include these students as part of the Biology thesis course (like the Biology & PNB students), but it may be appropriate to also consider a plan that would be of benefit for all other PNB students who are also enrolled in a thesis course. Some ideas could include incorporating non-mandatory/non-graded occasionally meetings that are built into the PNB thesis course, led by a designate faculty member for example (like is done for the Biology Thesis/Project courses). If considered, this would then require a review on how this faculty member support would work into an individual's teaching allocation for the year.

Recommendation #11: Consider converting the computer lab into wet lab.

Department's Response: This seems like a good direction for our department. We have >500 students in our research-intensive PNB programs and only one undergraduate lab with a capacity of 20. With a larger and well-equipped wet lab, we could expand our lab offerings and make a laboratory course the standard experience for our PNB students once again. We could also consider converting our existing undergraduate lab to a space for level IV group theses, following the ALLURE lab model.

Actions to be Taken: Before we commit to converting our computer lab into a wet lab, we'd like to gather some more data, including,

a) Whether the space can be retrofitted to include sinks and drains, outlets for air and gas, and a fume hood.

b) The anticipated capacity of the new lab after construction. This will require renderings of the new space, complete with lab benches and prep spaces.
c) The cost of construction.

Our Academic Department Manager will reach out to Facilities Services to gather this information. If the faculty agree to pursue this construction project after reviewing the data, we'll write this into our next budget.

Dean's Response: Given the current fiscal challenges, the Faculty is not in a position to be able to commit to any new capital projects. While exploratory work can be done around the feasibility of the conversion, we will need to hold any commitment to a potential project at this time.

Recommendation #12: Consider converting a meeting/seminar room into faculty offices to allow new hiring.

Department's Response: Yes, we agree with this recommendation.

Actions to be Taken: The Department Administrator will seek estimates for the cost of converting one meeting room into two office spaces. The Chair will incorporate this cost into our annual budget when we are hiring again.

Dean's Response: Given the current fiscal challenges, the Faculty is not in a position to be able to commit to any new capital projects. While exploratory work can be done around the feasibility of the conversion, we will need to hold any commitment to a potential project at this time. We encourage the Department to keep this recommendation as part of long-term planning and its annual budget requests.

Recommendation #13: Strategically introduce new faculty lines that address both teaching and research priorities to fill holes left by retiring faculty and bring faculty-to-student ratios more in line with other science departments).

Department's Response: We do consider both teaching and research when identifying hiring priorities. PNB has strengths in animal behaviour, cognition and perception, and neuroscience. With our planned hires, we endeavour to reinforce our strong tradition of teaching and research excellence in these areas and to build bridges between areas in our department. According to our five-year strategic plan, our next hire will be in the area of Neuroethology. This hire would (a) support teaching in the Neuroscience and PNB programs (note that PNB teaches significantly more "psychology" courses than "neuroscience" or "animal behaviour" courses, see Appendix A), (b) advance the goals of those programs to be research-focused (recall there are currently very few labs that can take neuroscience students), and (c) reinforce linkages between our neuroscience and animal behaviour groups. Following the Neuroethology position, our hiring plan lists 8 specific positions. As teaching faculty don't come with research programs or graduate students (i.e., TAs), pursuing such hires would result in fewer research opportunities and skills-based assessments for undergraduate students. Rather, we have prioritized the hiring of research faculty who can also strengthen the teaching effectiveness of the department.

We do want to bring the student-to-faculty ratio down, but we want to accomplish this in a strategic way that supports both our teaching and research goals, rather than in a reactive way (i.e., in

response to the growth in the Applied Psychology program). Recall that the Applied Psychology program grew because it is our only open program; however, we plan to cap this program and do not wish to dedicate hires to support it. While we expect our proposed program in Psychological Science to be large, we have many experimental psychologists in our department who could teach courses in psychology (recall Appendix A). Although we're required to have an open enrolment program, we do not intend to let the large student numbers in the (unlimited) Psychological Science program dictate our new faculty hires.

Actions to be Taken: Our FAAC proposals will more clearly articulate how the proposed hire will support undergraduate teaching and undergraduate research.

While we transition from an open Applied Psychology in Human Behaviour program to a new open program in Psychological Science, it may be best to have CLA support rather than make permanent hires based on program enrolments.

Dean's Response: Throughout fiscal year 2023, Faculty of Science undergraduate Teaching Units/ Instructor average across all departments ranged between 3,277 to 6,140 units with a median value of 4,403 units. The Department of PNB Teaching Unit/Instructor is 4,557 units, which is in line with the Faculty median. While recognizing the need for research track hires, given the current financial challenges, the Faculty is unfortunately not in a position to be able to commit to any faculty hires at the moment. The FAAC process is currently on hold, but the Faculty has asked all units to submit their next FAAC requests at this time with a focus on teaching stream faculty. Each unit has been permitted to submit one teaching stream hire application to the committee for consideration and ranking. We are hopeful that we will be able to return to research-track hires in the near future. In the interim, we encourage the Department to consider how best to request teaching-track hires that may be able to support curriculum and programming needs.

Recommendation #14: Ensure TA support meets teaching needs by matching hours to course enrolment, hiring more undergraduate TAs for level 2 courses and considering a full-time instructional assistant for wet labs.

Department's Response: PNB has procedures for TA assignment, and we do not follow a formula that is based on course enrolment. Rather, we assign TAs based on support needs, prioritizing courses that are required to meet program learning outcomes (PLOs). For example, the student-to-TA ratio in level II required PNB courses (e.g., 2XB3, 2XD3) is approximately 25:1. This is balanced by a larger student-to-TA ratio in other courses (e.g., PSYCH 3AC3 – Human Sexuality had 3 TAs for ~180 students in 2022-2023).

We agree that hiring undergraduate TAs is a good way to expand our instructional team at a low cost. In fact, undergraduate TAs have some benefits over graduate TAs (e.g., they apply for TAships voluntarily and tend to be highly motivated). In addition to the ~40 undergraduate TAs that we typically hire for our IntroPsych courses, last year we hired ~10 undergraduate TAs to support two level II PSYCH courses (2GG3, 2NF3).

A full-time instructional assistant to support wet labs would allow us to offer multiple sections of our neuroscience and animal behaviour labs.

Actions to be Taken: The Associate Chair (Undergraduate) will assign TAs first to required courses, and then the remaining TAs will be distributed to courses based on their support needs (e.g., lab courses or writing courses require more TAs than courses with multiple-choice tests).

In 2023-2024 we aim to expand our team of undergraduate TAs to ~40 students, supporting 8 level II PSYCH courses throughout the year. This will allow for the redistribution of graduate TAs to upper year courses.

Although we don't need a full-time instructional assistant to support wet labs right now, it would be very helpful if our 50% lab technician could be converted to a 50% instructional assistant. This would allow him to take on additional responsibilities such as introducing and demonstrating labs and providing guidance and advice to teaching assistants. We can return to the idea of a full-time instructional assistant once the plans for a new lab space have been fleshed out.

Dean's Response: The Faculty appreciates the careful approach taken by the Department around teaching assistant allocation. The Faculty has recently launched a teaching assistant allocation guide, and we encourage all Departments to review suggested best-practices as suggested within the guide when considering teaching assistant assignments. Similarly, all undergraduate TA requests are submitted as part of the annual budget submission exercise by each unit and reviewed by the central Faculty Finance committee.

Given the current fiscal challenges, the Faculty is unfortunately not in a position to be able to consider a full-time instructional assistant to help with wet lab support. We encourage the Department to model out future curriculum and programming growth opportunities and to consider proposing this request in future budget cycles once the Faculty has emerged from its current deficit management plan.

Recommendation #15: Develop a plan to address the mismatch between gender ratios in faculty and student bodies.

Department's Response: We are aware of the mismatch between gender ratios in our faculty and student bodies; this mismatch will only get worse with the next few faculty retirements. PNB is keen to hire more women, especially in tenure-track positions.

Actions to be Taken: We will consult with HR about the possibility of a diversity hire (targeted to women), following the model set by McMaster's Department of Mechanical Engineering.

When we are hiring again, we will do our best to remove barriers for woman applicants. We will carefully craft job ads (and titles) to encourage more women to apply (for example, by using gender-neutral language and referring to the Faculty of Science Life Events Support Program). We'll post the advertisements broadly, especially in media that are consumed by women. Finally, we'll think critically about the criteria to be used for short-listing candidates. (Even with these practices, however, without a targeted hire we may still hire men.)

For now, our Chair will ensure that women in PNB are not asked to do more service because of the need to diversity committees.
Dean's Response: The Faculty applauds the work being carried out by the Department to ensure that it is an inclusive and equitable environment for its students, faculty, and staff. The Faculty encourages the Department to work with the Science Office of the Associate Dean, Equity, Diversity, Inclusion, and Indigeneity as it works towards these goals.

Recommendation #16: Improve communication and consultations with other departments and governance bodies.
Department's Response: We agree that there is work to be done to improve communication within the department and between the department and other areas of the university (and beyond). PNB offers over a dozen undergraduate programs, many of which are interdisciplinary and/or administered collaboratively. This can make communication difficult because there are many stakeholders involved. For example, the PNB programs are offered by both the Faculties of Science and Social Sciences, the BioPNB and Neuroscience programs are co-administered with Biology, the PNB Music Cognition Specialization is a collaboration with the School of the Arts, and the Applied Psychology Specializations are co-administered with Mohawk College. Our Department (and the University) highly values interdisciplinary and collaborative programs; however, there is an administrative cost to operating and managing them. It is clear that all of these duties cannot fall on the Associate Chair (Undergraduate), and we are working towards a model where program administration is distributed among several faculty, staff, and students. **Actions to be Taken:** The governance model in PNB includes a Curriculum Committee (Chaired by the Associate Chair (Undergraduate)) that receives recommendations from several Steering Committees. The Steering Committees oversee the interdisciplinary/collaborative programs, including BioPNB, Neuroscience, and the Applied Psychology in Human Behaviour Specializations. We can improve on this model in several ways. 1) Create a Music Cognition Steering Committee. 2) Appoint a lead to each Steering Committee who is responsible for liaising with the Associate Chair (Undergraduate). 3) Require each Steering Committee to meet **at least** annually, with the expectation that curriculum changes be brought to the Undergraduate Chair by June 30th. 4) Recruit a student representative to each Steering Committee. (The Neuroscience Steering Committee already has 3 student reps, one from each level of study.) For the 2023-2024 academic year, the Associate Chair (Undergrad) will continue to hold biannual "Chat with the Undergraduate Chair" meetings, rather than invite students to join the PNB Curriculum Committee. This is because (a) it would be practically challenging to schedule meetings with 4-5 faculty and student reps from each of the programs, (b) some of the material discussed in Curriculum meetings is confidential (e.g., regarding leaves), and (c) Chat with the Undergrad Chair meetings are dedicated opportunities for students to raise concerns, whereas there are fewer opportunities for

students to speak during Curriculum Committee meetings. Given that this model was only introduced in 2022-2023, we would like to give it another year before we try a new model.

We need a better method for communicating with the Faculty of Social Sciences. Currently, our Associate Chair (Undergrad) is tasked with attending the Academic Planning & Policy Committees for both faculties, which can be challenging especially in the Fall term. We will consider adopting the model used by the School of Earth, Environment and Society (SEES). In SEES, the Undergraduate Chair attends the Faculty of Social Sciences UAP&PC meetings and sends a delegate to attend the Science AP&PC meetings. The delegate should sit on the PNB Curriculum Committee so that up-to-date information can flow regularly to and from both faculties.

Finally, we want to improve communication between our faculty/staff and our student body. As mentioned in recommendation #9, our teaching staff are updating the PNB website to provide more information about our programs and procedures. Our Undergraduate Administrative Assistant is developing relationships with the student societies and will post society information on our website and on the display monitor in our main lobby. Finally, the Associate Chair (Undergraduate) will reach out to the societies at the beginning of each academic year to share information about advising resources, instructional supports, and to develop a rapport with the students to encourage open dialogue. The Undergraduate Chair will also encourage faculty to participate in and attend student events to revive our departments vibrant social atmosphere that existed pre-COVID.

Dean's Response: The Faculty applauds the Departments efforts to increase the lines of communication both within and outside of the Department. We continue to encourage consultations with students as key stakeholders and suggest possibly also inviting the Presidents of the undergraduate societies to sit as representatives on the PNB Curriculum Committee. This will provide consistency in student representation throughout each academic year and may also be useful to help the Department in deploying innovations or changes in curriculum and pedagogy.

With the establishment of the Joint Curriculum Advisory Committee between the Faculties of Science and Social Sciences, there will be great opportunity for continued communication between both Faculties. This committee will be supported by the respective Offices of the Associate Dean, Undergraduate Studies for both Faculties.

Implementation Plan

Summary of the Reviewers' Recommendations with the Department's and Dean's Responses

Recommendation	Action(s) to be Taken	Responsibility for Leading Action (specify the role(s) that will be responsible for each action item e.g. Program Chair.)	Timeline for Completing Action (indicate specific timelines (e.g. not 'ongoing') for action)
1.	Bring proposal to cap the Applied Psychology in Human Behaviour program to AP&PC and AUP&PC (contingent on opening another program)	Nikol Piskuric	September, 2023 Not supported by Faculties of Science and Social Sciences until an appropriate plan is in place
2.	Resurrect Psychological Science program	Nick Bock	Now through October, 2023 Not supported by Faculties
3.	Hire at least one CLA	Mel Rutherford	May – July, 2024 Despite the current financial challenges, the Faculty has extended the existing CLA appointment of Dr. MacGowan for a total appointment of 18 months (started in January 2024)
4.	Bring proposal to develop an Open Enrolment Policy Working Group in the Faculty of Science to AP&PC	Nikol Piskuric	September, 2023

			Department encouraged to consider alternate approach to current enrolment targets
5.	Bring proposal to cap the PNB Mental Health Specialization to AP&PC and UAP&PC	Nikol Piskuric	September, 2023 Currently going through governance approval to close this program.
6.	Create a Music Cognition Steering Committee to develop and implement a marketing plan and re-evaluate program prerequisites Explore direct-entry	Trainor, Brown, Cannon, Fink, Iverson Nikol Piskuric and Music Cognition Steering Committee	Starting now and running and improving continuously Nov through summer 2024
7.	Consider program prerequisites	Neuroscience Steering Committee	Now through Fall, 2023
8.	Gather more data re: level II PNB course scheduling	Mel Rutherford; Nikol Piskuric	Fall 2023 and Spring 2024
9.	Update website; Create new thesis sorting process.	Nikol Piskuric; Taylor Bowker; Jennifer Nettleton; Ellen MacLellan	Now through March, 2024
10.	In-class instruction to support thesis experience	Neuroscience Steering Committee	Now through April, 2024
11.	Gather more data re: construction of a wet lab in the existing computer lab	Milica Pavlica	Now through October, 2023 Not possible given current financial challenges

12.	Seek cost estimates for converting a meeting room into two offices	Milica Pavlica	ASAP Not possible given current financial challenges
13.	Improve messaging in FAAC proposals re: contributions of research faculty to undergraduate programs	Mel Rutherford	Fall, 2023
14.	Create guidelines for TA assignments	Nikol Piskuric	Done
15.	Address Gender ratio	Mel Rutherford and Sigal Balshine	When faculty hiring recommences
16.	Coordinate among steering committees Chat with the Associate Chair	Steering committees and Nikol Piskuric Nikol Piskuric	Now and continuing Bi-annually

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Appendix A.

Level III and IV PSYCH, PNB and NEUROSCI courses roughly separated into Psychology, Neuroscience and Animal Behaviour Course Lists

		PSYCHOLOGY		NEUROSCIENCE		BEHAVIOUR	
		CODE	NAME	CODE	NAME	CODE	NAME
Level III	1	PNB 3HP3	History of Psychology	NEUROSCI 3J03	Visual Neuroscience	PSYCH 3EV3	Evolution & Mental Health
	2	PSYCH 3NL3	Cognitive Neuroscience of Language	NEUROSCI 3SN3	Neural Circuits	PSYCH 3T03	Behavioural Ecology
	3	PSYCH 3WA3	Mind as a Work of Art	PSYCH 3A03	Audition	PSYCH 3F03	Evolution & Human Behaviour
	4	PSYCH 3AB3	Adolescent Psychology	PSYCH 3FA3	Neuroscience of Learning and Memory	PSYCH 3M03	Motivation and Emotion
	5	PSYCH 3AC3	Human Sexuality				
	6	PSYCH 3AG3	Aging				
	7	PSYCH 3B03	Special Populations				
	8	PSYCH 3BA3	Positive Psychology				
	9	PSYCH 3BN3	Cognitive Neuroscience				
	10	PSYCH 3CB3	Attitudes and Persuasion				
	11	PSYCH 3CC3	Forensic Psychology				
	12	PSYCH 3D03	Multisensory Mind				
	13	PSYCH 3GG3	Essentials of Developmental Psychology				
	14	PSYCH 3JJ3	Socio-Emotional Development				
	15	PSYCH 3MT3	Psychometrics				
	16	PSYCH 3SP3	Science of Performance				
	17	PSYCH 3TT3	Science of Teaching and Learning				
	18	PSYCH 3UU3	Psychology of Language				
	19	PSYCH 3VV3	Human Memory				
Level IV	1	PSYCH 4A03	Assessment in Children	PSYCH 4KK3	Bayesian Inference	PSYCH 4R03	Special Topics in Animal Behaviour
	2	PSYCH 4MP3	Neuroscience of Music Cognition	**PNB 4J03**	**Inquiry in PNB**	**PNB 4J03**	**Inquiry in PNB**
	3	PSYCH 4E03	Social Diversity … Lens Cog. Neurosci.				
	4	**PNB 4J03**	**Inquiry in PNB**				

Note: This table does not include courses on the lab list.

Quality Assurance Committee Recommendation:

McMaster's Quality Assurance Committee (QAC) reviewed the above documentation at the June19, 2024, meeting. The committee recommends that the **Psychology, Neuroscience & Behaviour** undergraduate program should follow the regular course of action with an 18-month progress report and subsequent full external cyclical review to be conducted no later than eight years after the start of the last review.