

Committee Assignment Problem

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Furman University Faculty Governance

- Furman professors are expected to serve on one committee a year as per the Faculty Governance.
- Committee service is considered as part of a tenure package.
- Each committee assignment lasts for three years.
- Faculty members fill out a preference survey.
 - Rank as many preferred committees as they want
 - Rank at most four non-preferred
- The nominating committee assigns new positions.



The Problem

- Assign faculty member to committee so that all committee seats are filled
- **Objective:** Maximize faculty assignment preferences



"I know nothing about the subject,
but I'm happy to give you my expert opinion."

Decision Variables

$$x_{ij} = \begin{cases} 1 & \text{if faculty member } i \text{ is assigned to committee } j \\ 0 & \text{if else} \end{cases}$$

Objective Function

$$\text{Maximize } Z(X) = \vec{1}^T (P^T X + \alpha A^T X) \vec{1}$$

Where P is a matrix of faculty preferences

α is a scalar

A is a matrix of eligible assistant professors

Model Constraints

One assignment per professor:

$$\text{For Faculty Member } i, \sum_{j=1}^c x_{ij} = 1$$

Committee size:

$$\text{For Committee } j, \sum_{i=1}^f x_{ij} = S_j$$

At least one tenured professor per committee:

$$\text{For Committee } j, \sum_{i=1}^f t_{ij} x_{ij} \geq 1$$

At least one man per committee:

$$\text{For Committee } j, \sum_{i=1}^f m_{ij} x_{ij} \geq 1$$

At least one woman per committee:

$$\text{For Committee } j, \sum_{i=1}^f w_{ij} x_{ij} \geq 1$$

Where c is the number of committees
 f is the number of faculty members

S_j is the size of committee j

\vec{t} is tenured professors

\vec{m} is male professors

\vec{w} is female professors

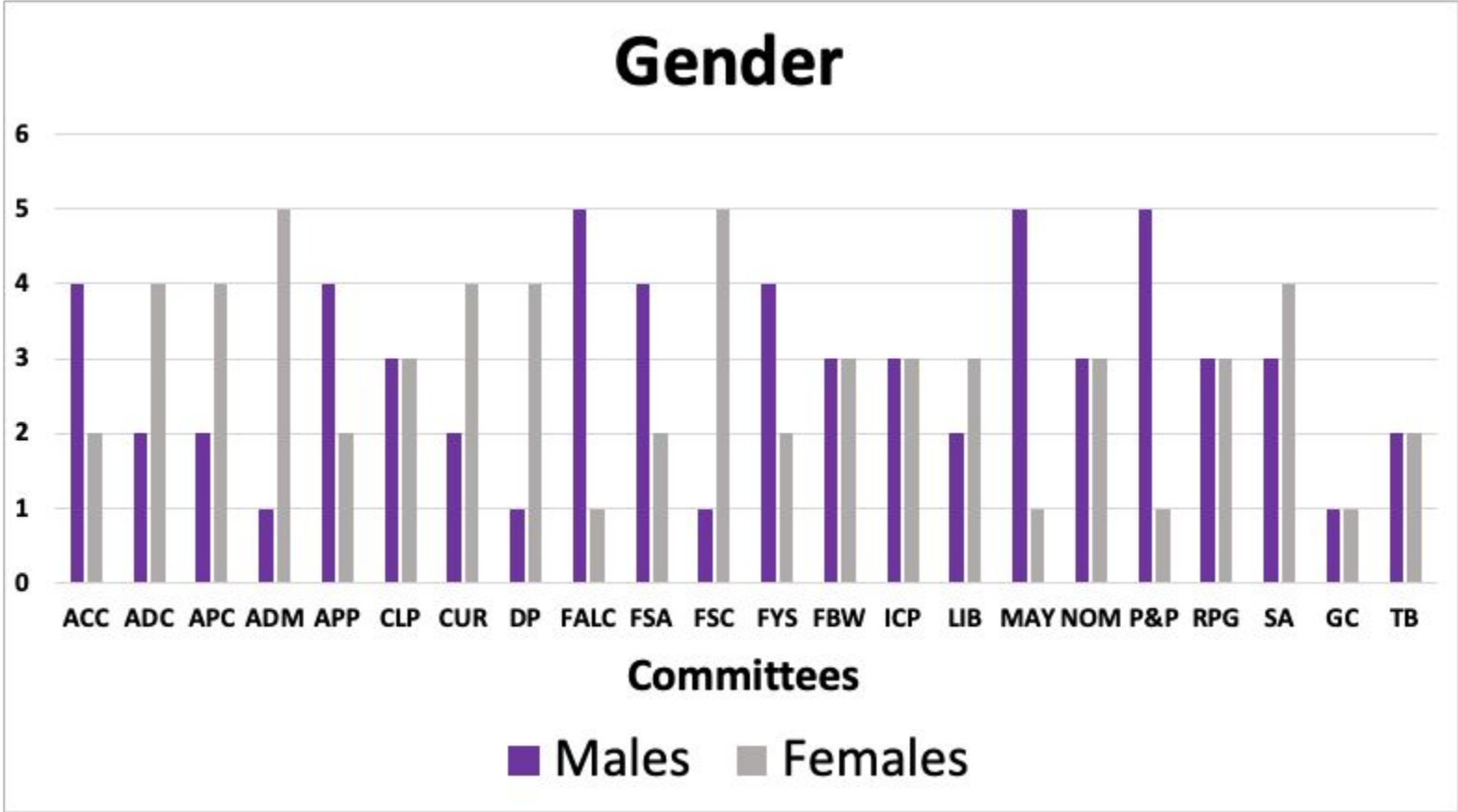
More Constraints

- Eligibility
- Third year chairs
- Due Process, Faculty Status
- Library
- No repeat assignment
- Divisional balancing constraints

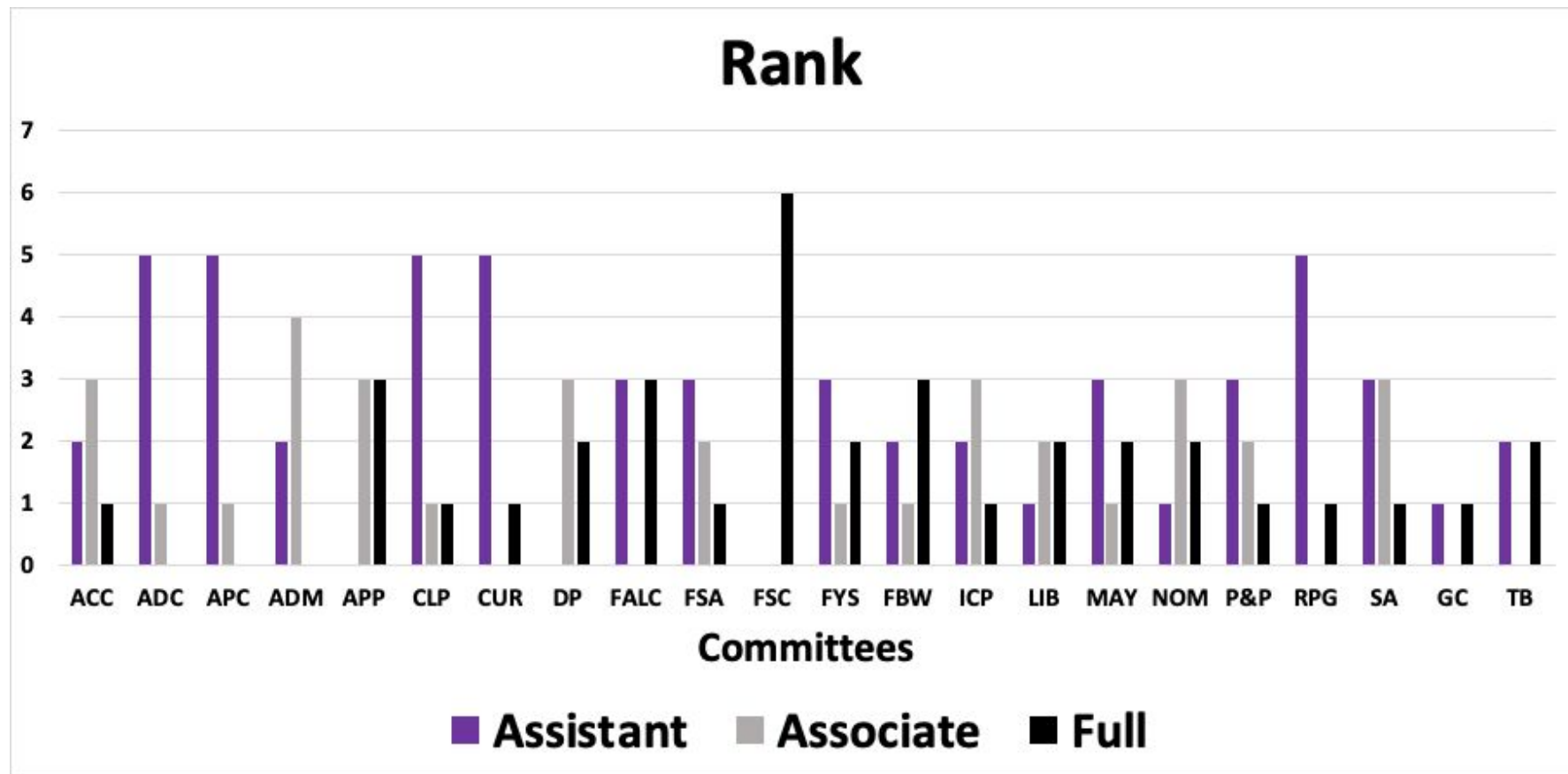


**“Here are the minutes from our last meeting:
Marty wasted 12 minutes, Janice wasted 7 minutes,
Carl wasted 27 minutes, Eileen wasted 9 minutes...”**

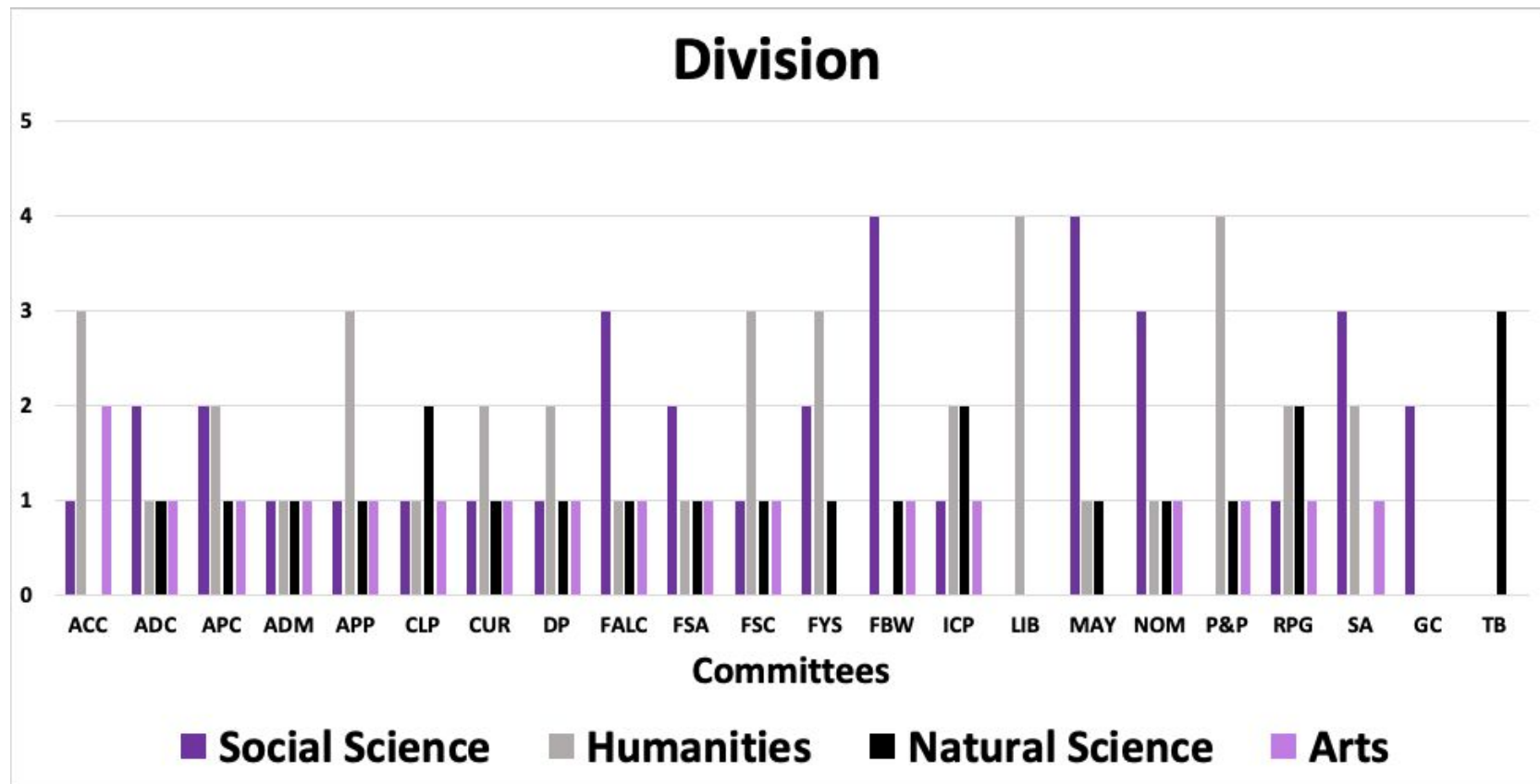
Results



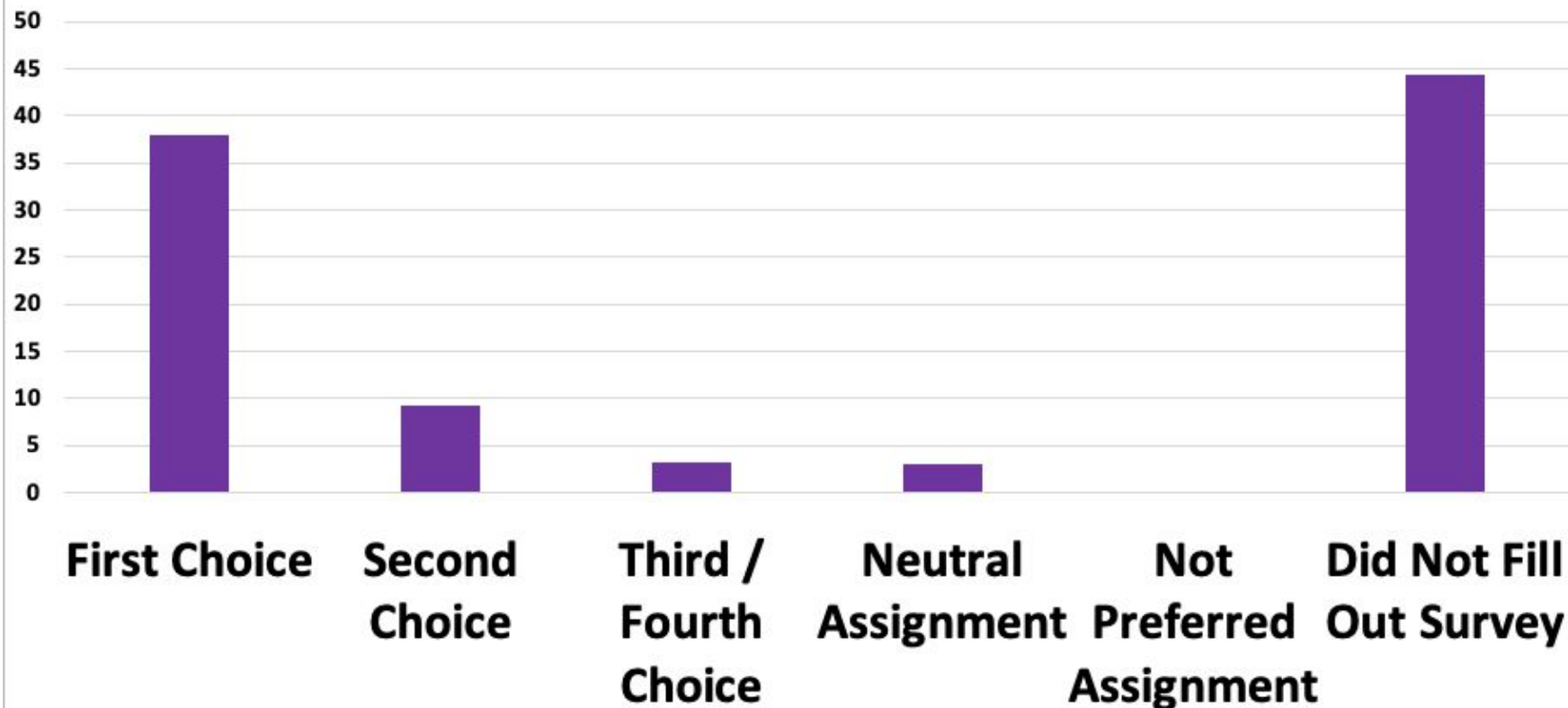
Results



Results



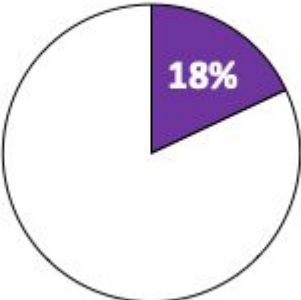
Average Preference Scores Over Three Years



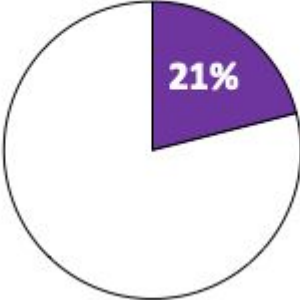
Exploring Gender Imbalance



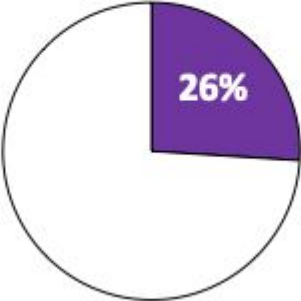
Males



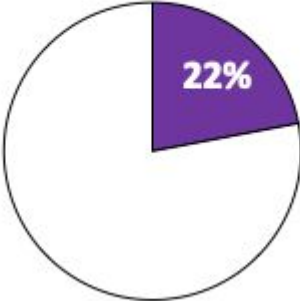
Males



Females



Females



 **serving**

 **not serving**

Benefits

- 100 person hours required to solve this problem by hand
- Personal politics reduced
- Increased workload will not require an increase in time commitment
- Flexible application that can adapt with changes in committee structure



"Hurray! Meeting adjourned!"

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Questions?
