PA 4010 Public Affairs Decision Making

SESSION 4: CONSEQUENCES AND TRADEOFFS

THURSDAY 29 AUGUST 2024

Agenda for Today

▶ Homework 1 is available. Due Tuesday.

▶ Next class: `Workshop`. Please print your computer/tablet/cell phone.

Objectives

▶ Constructing a consequence table.

▶ Making tradeoffs within a consequence table

  ▶ Additive utility function

  ▶ Alternative utility functions

Consequences

Estimate the likely consequences of all possible alternatives against our objective to identify the alternative that *maximizes* our objectives.

▶ Consequence Tables (Criteria/Alternative Matrix)

  ▶ Good for decisions involving multiple objectives.

  ▶ Best when little uncertainty involved in decisions (though not necessary).

  ▶ Only as good as the person making the matrix (bad data in, bad results out).

  ▶ Some flexibility in functional form.

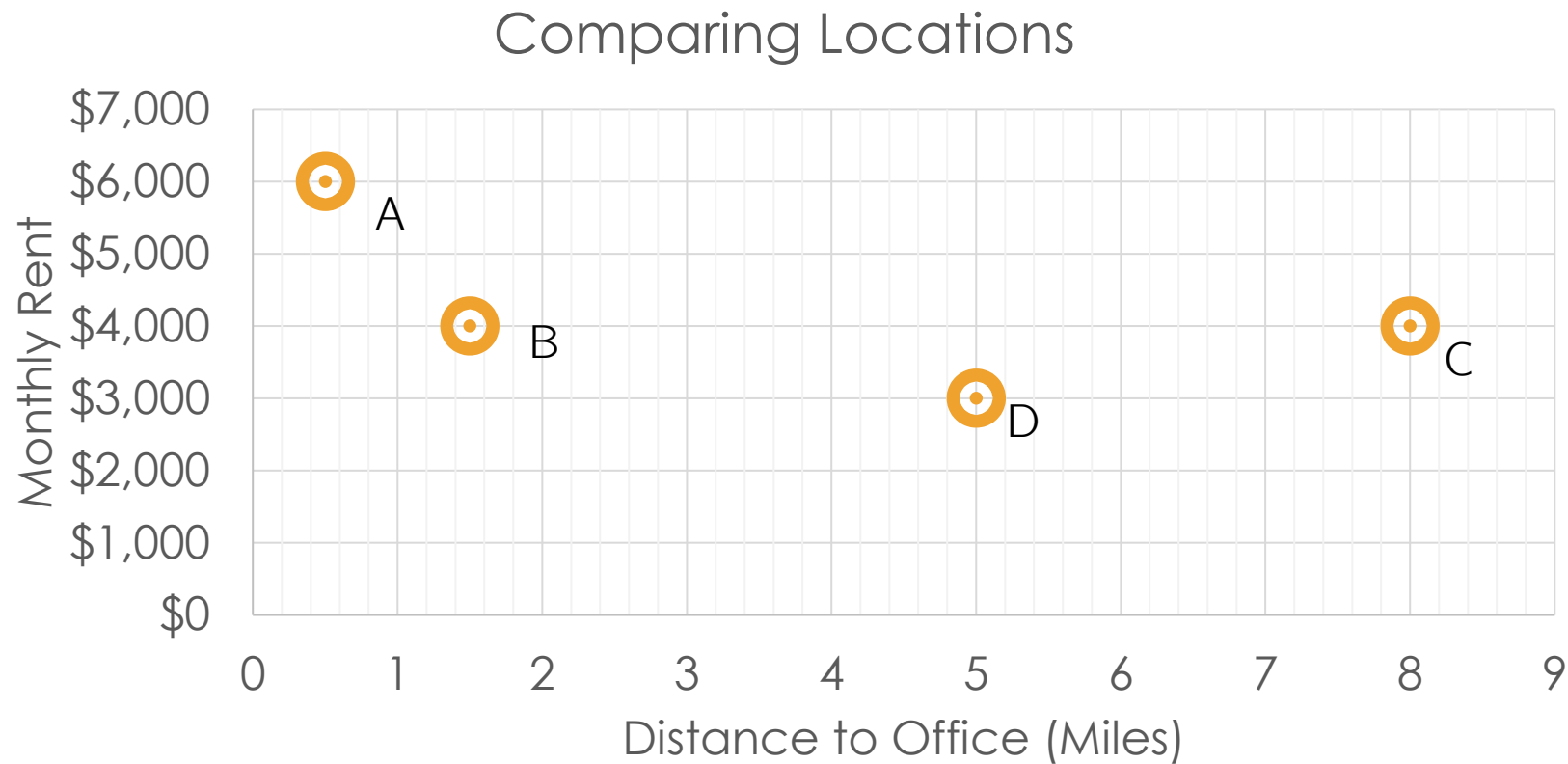# Example: Selecting a new office location for a nonprofit social service organization

Only Two Objectives

Comparing Locations
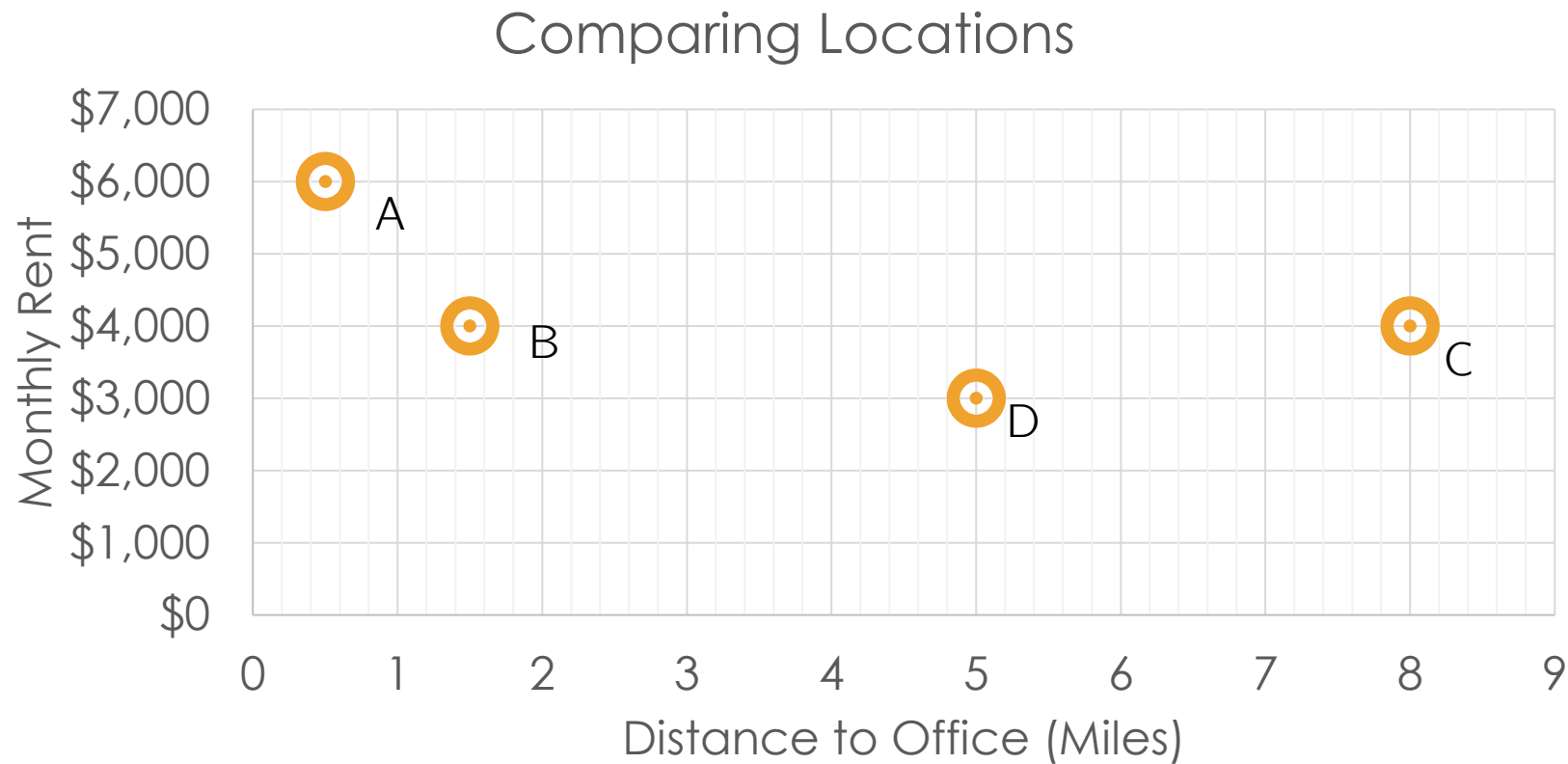
Objectives: minimize monthly rent and minimize distance to office

Only Two Objectives

Comparing Locations

Is there an alternative, using only these two criteria, that we can eliminate right away?

But, we often have multiple objectives...

Objectives (attributes in red):

- Minimize cost
  - $ amount of monthly rent
- Maximize accessibility for clients
  - Distance to agency (miles? Note: most clients walk or take the bus)
  - Parking spaces available (Note: most clients walk or take the bus)
- Maximize amenities for staff
  - Privacy (number of private offices)
  - Parking spaces available (Note: most staff drive; there are 5 staff members)
  - Modern and comfortable (how do we measure this?)

Setting up a good matrix

		Alternatives		
		Dorm	Single Apartment	Fratnerity House	House with Roommates
Objectives	Cost of rent (per semester)	5,000	4,000	2,000	1,500
	Filthiness	Low	Low	Very High	Medium
	Ability to make friends	High	Very low	High	Medium
	Distance to campus	100 m	1 mile	1 mile	1 mile
	Cost of food (per semester)	$0	$2,000	1,000	$500

▶ Is anything missing from this list of objectives?

▶ What are potential limitations of the way this matrix is currently set up?

▶ What's our immediate conclusion?

Setting up a good matrix – easy fixes

		Alternatives		
	Dorm	**Single Apartment**	**Fratnerity House**	**House with Roommates**
Cost of rent (per semester)	5,000	4,000	2,000	1,500
Cleanliness	High	High	Very Low	Medium
Ability to make friends	High	Very low	High	Medium
Distance to campus	0.06 mile	1 mile	1 mile	1 mile
Cost of food (per semester)	$0	$2,000	1,000	$500

Objectives

▶ Let's reframe filthiness as cleanliness.

▶ Change all distances to miles.

▶ Can we decide anything now (immediately)?

Setting up a good matrix – strat 1 (rank)

		Alternatives		
	Dorm	Single Apartment	Fratnerity House	House with Roommates
Cost of rent (per semester)	4	3	2	1
Cleanliness	1	1	3	2
Ability to make friends	1	3	1	2
Distance to campus	1	2	2	2
Cost of food (per semester)	1	4	3	2
Total	8	13	11	9

(left side label: Objectives)

▶ First, let's try a strategy where we rank within an objective across alternatives.

▶ Now, can we decide anything? If so, where do we choose to live?

▶ What limitations does this strategy of ranking place on our decision?

Setting up a good matrix – strat 2 (scale)

		Alternatives		
		Dorm	Single Apartment	Fratnerity House	House with Roommates
Objectives	Cost of rent (per semester)	0	28	85	100
	Cleanliness	90	90	0	50
	Ability to make friends	85	15	85	70
	Distance to campus	100	50	50	50
	Cost of food (per semester)	100	0	50	75
	Total	375	183	270	345

▶ This new strategy makes each objective its own scale based on the individua's preferences.

   ▶ 100 is the best you could hope for. 0 is the worst you could hope for.

   ▶ Now distances between alternatives might be more meaningful than a simple rank.

▶ Can we decide anything? If so, where do we choose to live? What do you notice about the objective function?

▶ What limitations does this strategy of ranking place on our decision?

Setting up a good matrix – strat 3 (weighted)

Objectives		Weight	Dorm	Single Apartment	Fratnerity House	House with Roommates
				Alternatives		
	Cost of rent (per semester)	20%	0	28	85	100
	Cleanliness	20%	90	90	0	50
	Ability to make friends	20%	85	15	85	70
	Distance to campus	20%	100	50	50	50
	Cost of food (per semester)	20%	100	0	50	75
	Total	100%	375	183	270	345

▶ Implicitly the previous strategy/strategies were giving equal weight to every objective.

▶ This might not be true in reality.

Setting up a good matrix – strat 3 (weighted)

Objectives	Weight	Dorm	Single Apartment	Fratnerity House	House with Roommates
			Alternatives		
Cost of rent (per semester)	25%	0	28	85	100
Cleanliness	20%	90	90	0	50
Ability to make friends	20%	85	15	85	70
Distance to campus	10%	100	50	50	50
Cost of food (per semester)	25%	100	0	50	75
Total	100%	350	165	279	364

▶ Suppose you are price sensitive, and you have some care about cleanliness and ability to make friends, but don't mind walking if you need to.

   ▶ You might come to a different decision.

Setting up a good matrix – strat 4 (unique util)

		Alternatives		
		Dorm	Single Apartment	Fratnerity House	House with Roommates
Objectives	Cost of rent (per semester)	0	28	85	100
	Cleanliness	90	90	0	50
	Ability to make friends	85	15	85	70
	Distance to campus	100	50	50	50
	Cost of food (per semester)	100	0	50	75
	Total	115	125	120	175

▶ In this scenario, you decide that you are going to focus on the two best qualities and the two qualities of each place and take the difference between them.

▶ Your ultimately decision might be similar, but the order/ranking of the alternatives is likely different (and certainly different over a large enough population).

Why is decision making in public affairs difficult?

▶ Complexity in criteria (objectives) and alternatives

▶ Uncertainty in outcomes

▶ Conflicting views leads to multiple conflicting decision criteria

▶ High stakes outcomes

▶ Collective- not individual! Replacing individual action with collective action

Group activity:
Social utility functions & public decisions

		Weight	Starbucks	Crimson Cup	Stauf's	Dunkin' Donuts
					Alternatives	
Objectives	Group Member 1	%				
	Group Member 2	%				
	Group Member 3	%				
	Group Member 4	%				
	Group Member 5	%				
	Total	100%	0	0	0	0

▶ Public decisions are a collective representation of individual preferences. Your group is tasked with definitively deciding what is the best coffee on campus.

▶ Use any of the strategies that we discussed and your group members' preferences. Be creative with your social utility function, and be specific with all the modeling criteria used. Be explicit with (1) rank/scale; (2) weights; (3) social utility function; (4) choice