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Contrast effects in judgmental forecasting when assessing the implications of worst- and best-case scenarios

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@Paul Goodwin. 19 June 2019

- All forecasts are based on assumptions about the future.
- When uncertainty is high we may need to have alternative sets of assumptions & produce different forecasts based on these assumptions.

E.g. Future demand for a UK firm's products may depend on which of these scenarios prevails:

1. The UK exits the EU without a deal.
2. The UK remains in the EU after all.

- To assess uncertainty it is useful to make forecasts assuming:

1. A worst-case scenario

2. A best-case scenario

for the environment or market within which our forecasts will be made.

E.g. Forecast of petrol sales in three years' time.

Worst case: Tumbling prices, rapid advances in battery technology and wide availability of recharging points lead to a surge in electric car sales.

Best case: The penetration of electric cars into the market is limited by high prices, slow advances in battery technology and a shortage of recharging points.

- Research question:
- Are judgmental forecasts for worst case scenarios affected when the forecaster has also read a best case scenario -and vice versa?
- Normatively the scenarios describe different future worlds so they should be made independently.

Context effects

Plous: '[People] do not perceive ...material in isolation; they interpret new information in light of past experience and the context in which the material occurs.'

Assimilation effect: Response to a target stimulus is positively correlated with contextual information.

e.g. Halo effects, Anchoring.

Context effects

Contrast effect: Response to a target stimulus is negatively correlated with contextual information.

e.g. A 5 kg weight seems lighter after lifting a heavier weight

A product seem less attractive after seeing superior brands.

Conditions favouring contrast effects

1. Large distance between context and target stimuli.
2. Unambiguous and distinct context stimulus.
3. Context stimulus is seen as relevant to dimension on which target stimulus is being assessed.
4. Explicit evaluation is made of context stimulus.
5. Short time interval between presentation of the two stimuli.

Definitions

Target scenario: In our case the scenario for which the forecast is being made

Context scenario : The opposite scenario which the forecaster has also read and which is irrelevant to the forecast.

Possible context effects

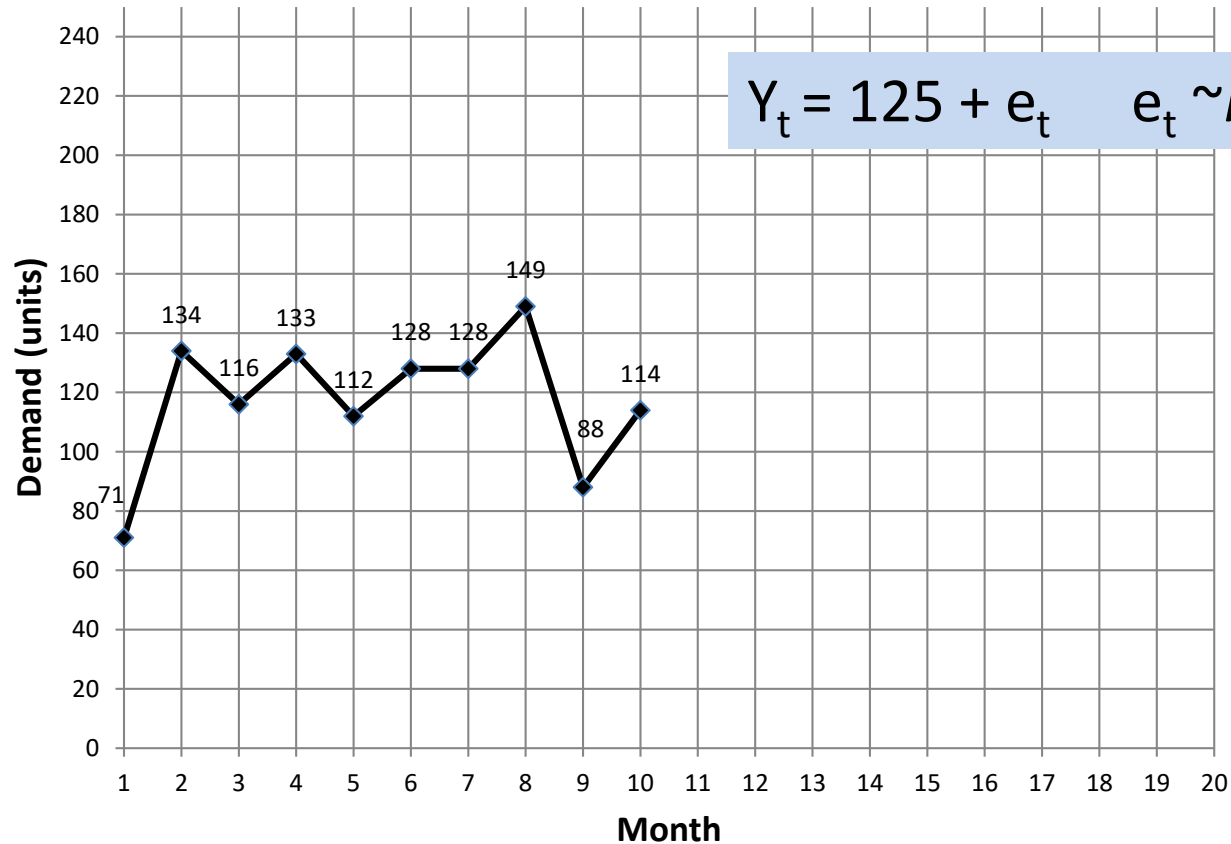
Assimilation effect : The forecast is moderated as a result of reading the context scenario

E.g . A forecast for a worst case scenario is made less pessimistic after the forecaster has also read a best-case scenario.

Contrast effect : The forecast becomes more extreme as a result of reading the context scenario.

E.g. A forecast for a worst case scenario is made more pessimistic after the forecaster has also read a best-case scenario.

Experiment 1: Example Task



Tablet computer: point forecast & prediction interval needed for month 20

Worst case scenario (extract)

We start to receive many complaints that the built-in apps do not work properly with upgrades to our operating system..... A competitor launches a rival product which is slightly cheaper ... and offers significant advantages ... including a more stylish look and superior screen display. The rival product receives much publicity

Best case scenario (extract)

Product A has an expanding and loyal user base. It is improved with some significant and attractive modifications and more built-in apps and these receive enthusiastic reviews in industry magazines No models directly compete with this product in its market. Market research reports indicate that the product's popularity is very high

Experiment 1: Design

- Group 1 Forecast 8 products receiving just one scenario for each - a mixture of best-case and worst case scenarios that were either moderate or extreme.
- Group 2 Same as group 1, but also received moderate context scenarios with opposite polarity to target scenarios. Having read both scenarios produced forecast for target scenario first.
- Group 3 Same as group 2, but also received extreme context scenarios with opposite polarity to target scenarios.

Experiment 1: Participants

114 business students from Bilkent and Sabancı Universities.

Group 1: $n = 42$

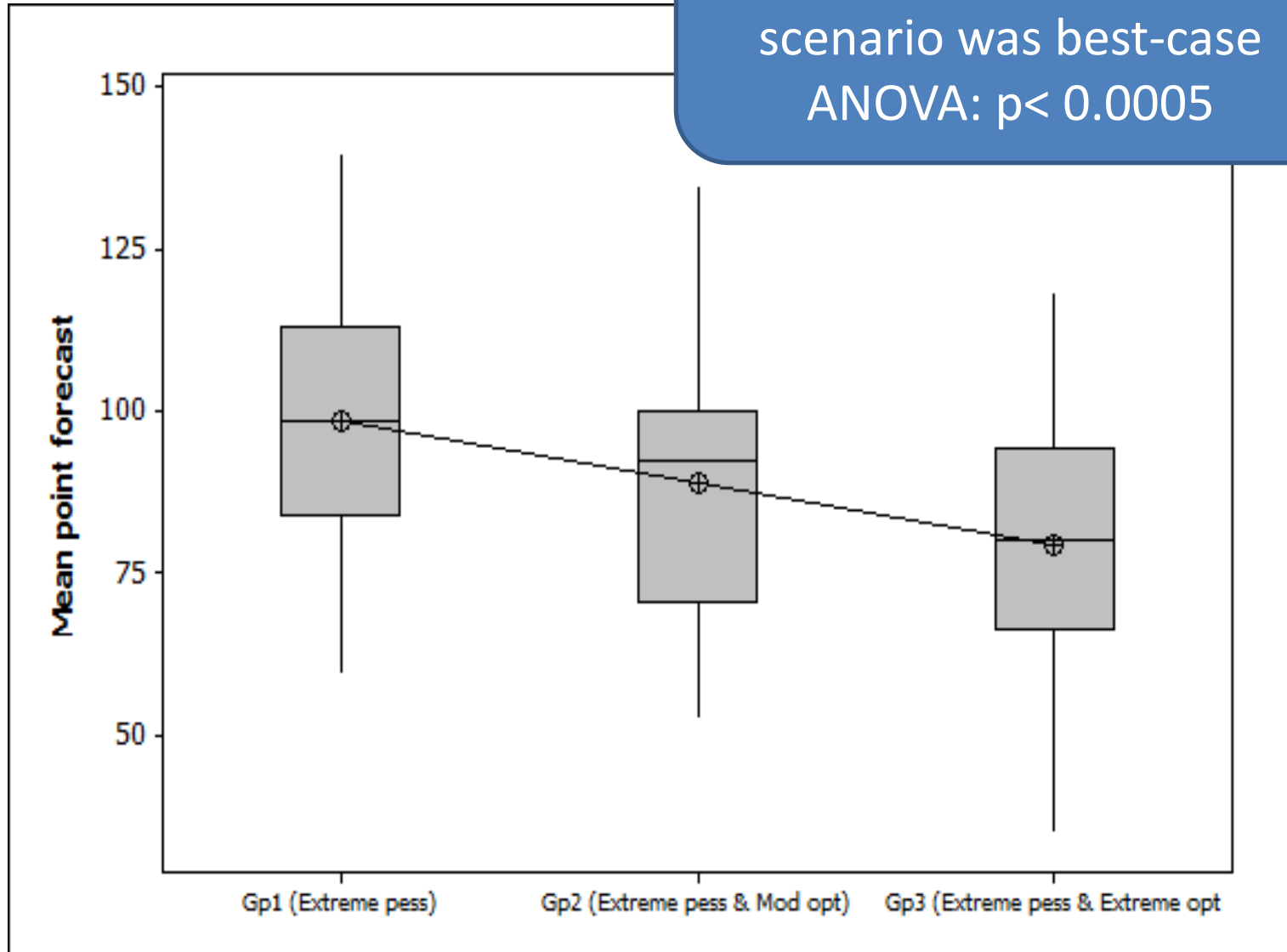
Group 2: $n = 35$

Group 3: $n = 37$

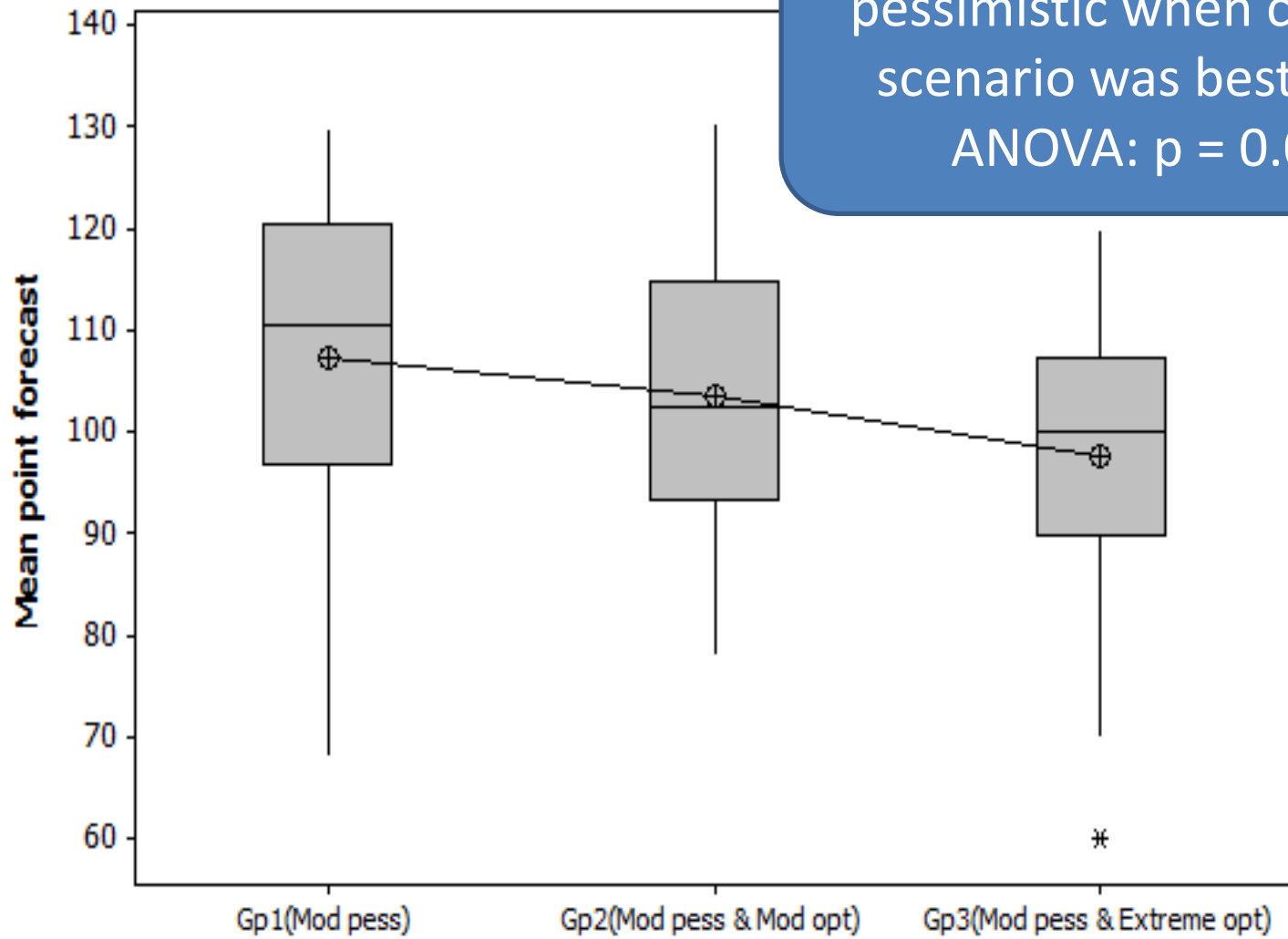
Experiment 1

Results for point forecasts

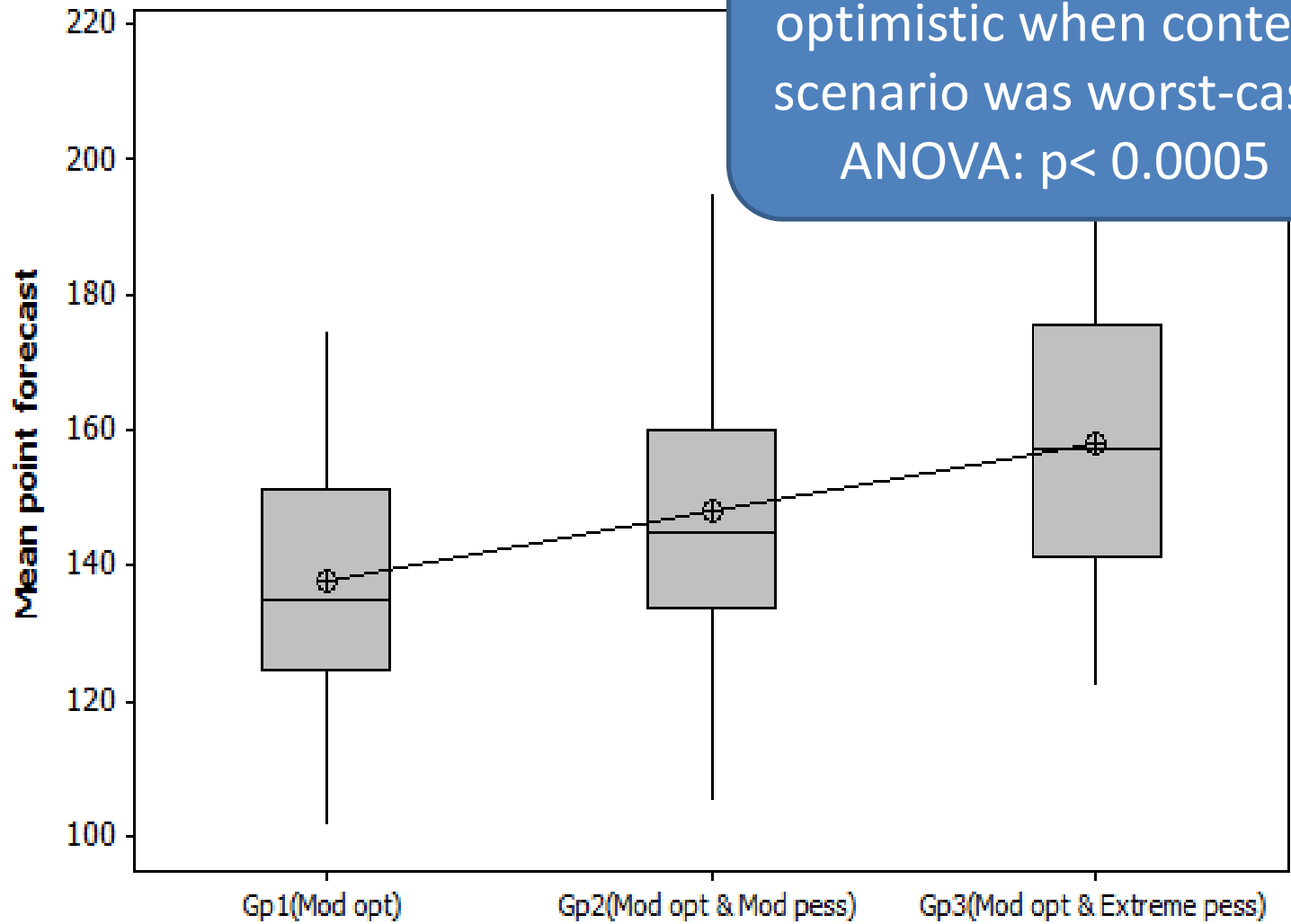
Forecasts were more pessimistic when context scenario was best-case
ANOVA: $p < 0.0005$



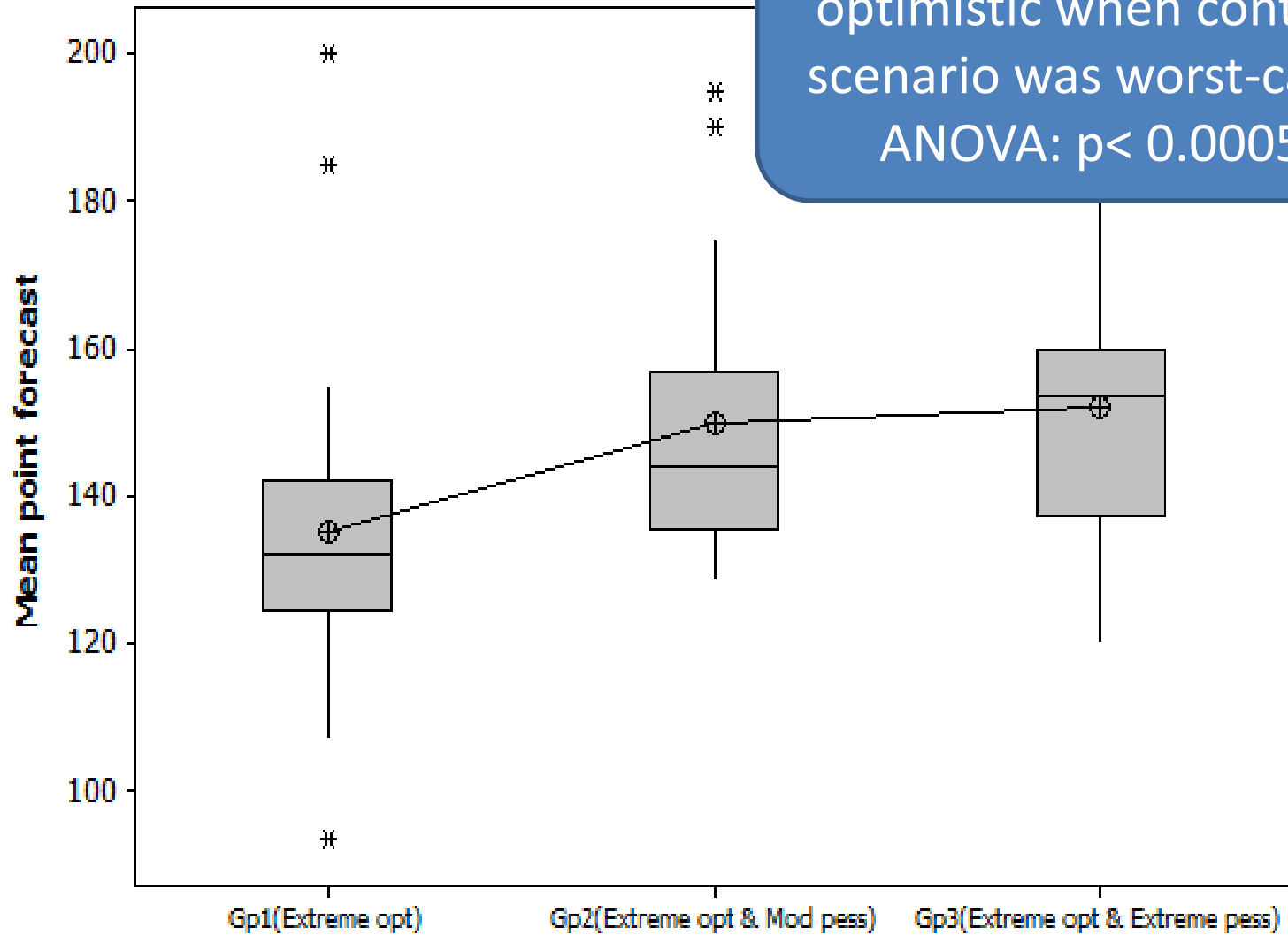
Forecasts were more pessimistic when context scenario was best-case
ANOVA: $p = 0.03$



Forecasts were more optimistic when context scenario was worst-case
ANOVA: $p < 0.0005$



Forecasts were more optimistic when context scenario was worst-case.
ANOVA: $p < 0.0005$



Experiment 1

Results for prediction intervals

- In all cases that the mean intervals became significantly narrower when ‘opposing’ scenarios were presented
- More extreme context scenarios led to narrowest widths

For example..

Group	Target scenario	Context scenario	Mean width	SD
1	Extreme pessimism	None	55.2	19.0
2	Extreme pessimism	Moderate optimism	41.4	18.7
3	Extreme pessimism	Extreme optimism	37.9	16.5
	$F_{2,111} = 10.1$		$p < 0.0005$	$\eta^2 = 15.4\%$

- Other research suggests extra information increases confidence even if it is irrelevant.

Experiment 2

- Similar to experiment 1
- Involved forecasting stock market indices for fictitious countries given different macro-economic scenarios.
- Results generally replicated those of experiment 1

Details in: Goodwin et al. (in press). Contrast effects in judgmental forecasting when assessing the implications of worst- and best-case scenarios. *Journal of Behavioral Decision Making*.

Conclusions

1. Contrast effects shape judgmental forecasts based on best or worst case scenarios when a scenario of the opposite polarity has also been seen.
2. More extreme contextual scenarios lead to bigger contrast effects.
3. Forecasts for target scenarios are made with more confidence when a contextual scenario is also presented.
4. The more extreme the context scenario the greater is the confidence in the target forecast.