Score Sequence Effects

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Score Effects

Score effects: losing teams dominate shots and goals. (Even though they usually still lose)
Score Effects

Who or what is causing these effects?
Score Effects

Who or what is causing these effects?

- The leading team, sitting back.
Goal Sequencing and Timing

Does it matter what order the goals are scored in or at what times?
Goal Sequencing and Timing

Does it matter what *order* the goals are scored in or at what *times*?

- A little bit yes.
Score effects, observed

All 5v5 unblocked shots, 2016-2019, home team perspective

Down 1

Tied

Up 1

Percentages are relative to league-average threat
We want to isolate the effect of the score from:

- The players’ abilities
- The venue (home/away)
- The time in the game
- The details of the score
Model

Start with a regression model with terms

- for every player
- for home ice
- for zone effects
- for the coach

Very similar to my day-to-day player ability estimate model, Magnus 2.
Fit the model with penalties that encode our prior knowledge.

- Deviation from the data is wrong
- Deviation from the prior is wrong
  - We get to say *how wrong*
We can impose penalties that quantify our prior belief that some outputs should be close some specified value.

OR

Close to *one another*. 
For every sequence of goals for and against:

- Sixty score terms, one for every minute of the game;

- Special term for the second period (because of the widdershins).

Fuse ’em together so that they function like not-that-many terms.
Results

Results!
Tied at 5v5, 2016-2019

Game Time vs Threat for different reactions:
- ah
- aahh
- ahha
- haha
- ha
- ahah
- haah
- hhaa

Graph showing the trend of threat over game time for different reactions.
Down 1 at 5v5, 2016-2019

Game Time

Threat

a
aah
aha
haa
Observations

- Second periods are fun, no matter what.
- Score effects are present right away but especially in the third.
- Trend suggests *leading* teams are the driving factor.
Goal Sequencing and Timing

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Goal Sequencing and Timing

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▶ With a given score taken as read, you’d rather be the team who scored most recently.
Most-recent-goal Advantage

Game Time

Threat

-2  -1  Tied  +1  +2
Immediate Goal Impact

By comparing score terms, we can see how teams respond to goals, for or against.
Impact of a Goal Scored

Game Time

Threat

-2 to -1
-1 to Tied
Tied to +1
+1 to +2
+2 to +3
Immediate Goal Impact

- Mostly teams respond to scoring by generating less offence.
- Mostly teams *don’t* respond to being scored on.
Conclusions

- Second periods are fun, no matter what.
- Score effects are present right away but especially in the third.
- Trend suggests *leading* teams are the driving factor.
Future Work

- Examine home ice more closely.
- Integrate score effects on penalties.
- Integrate score effects on non-location shot quality.
Thanks!