

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*?

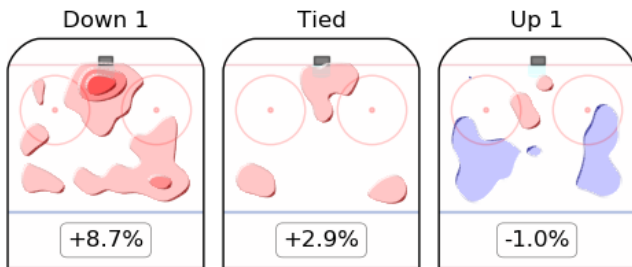
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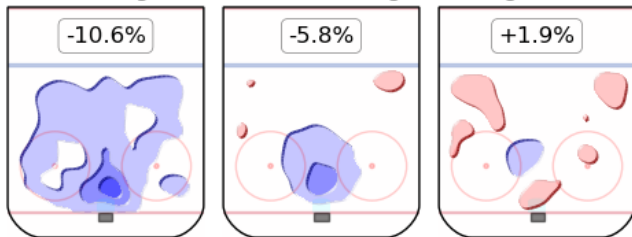
- ▶ A little bit yes.

Score effects, observed

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



Percentages are relative to league-average threat



Score effects, isolated

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.

Key Technical Bit

- ▶ 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*

Subtle Technical Bit

We can impose penalties that quantify our prior belief that some outputs should be close some specified value.

OR

Close to *one another*.

Score terms

For every sequence of goals for and against:

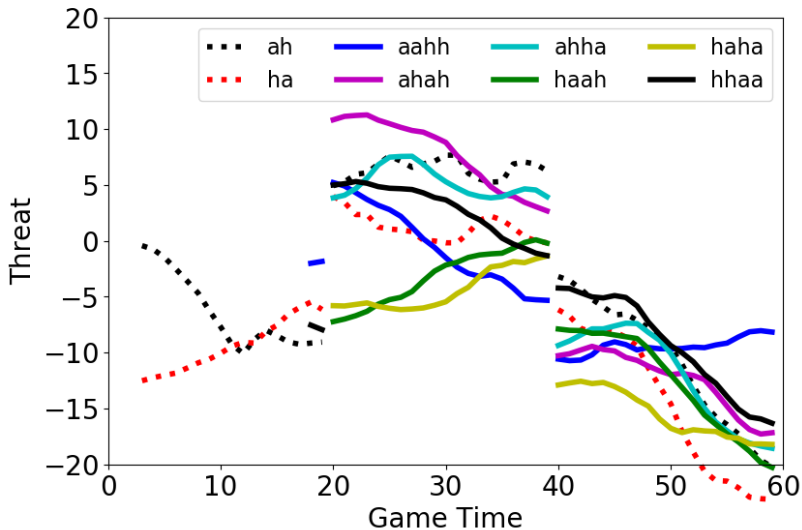
- ▶ Sixty score terms, one for every minute of the game;
- ▶ Special term for the second period (because of the widdershins).

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

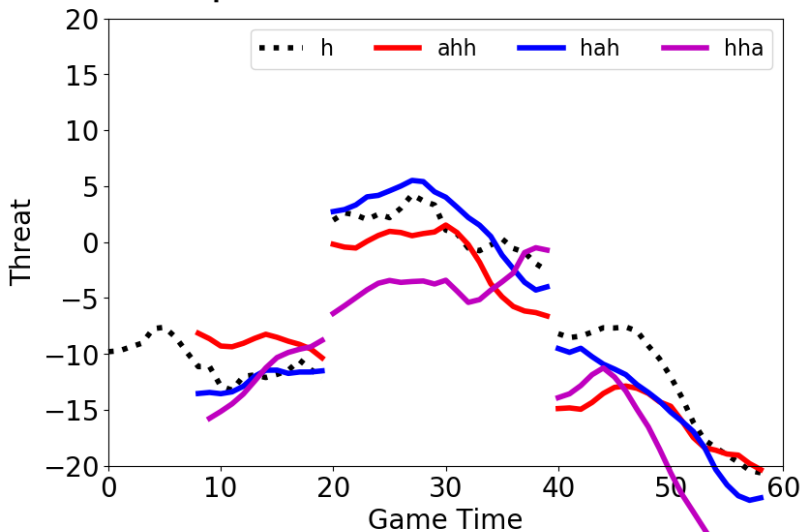
Results

Results!

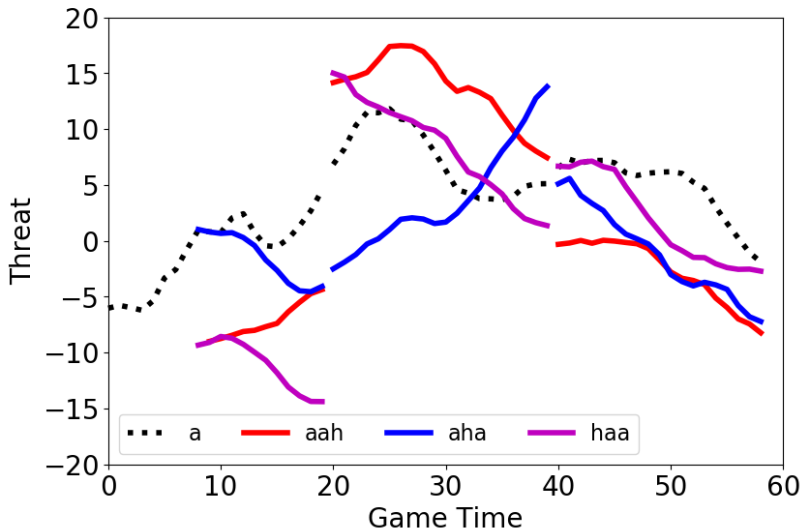
Tied at 5v5, 2016-2019



Up 1 at 5v5, 2016-2019



Down 1 at 5v5, 2016-2019



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.

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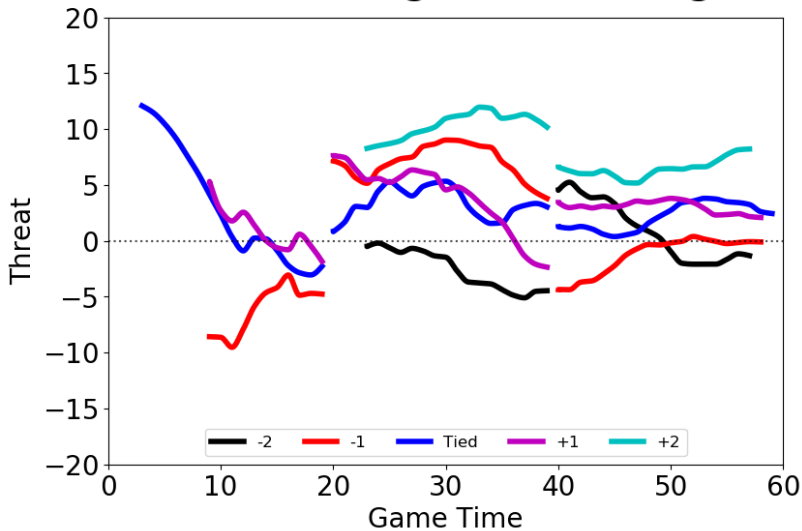
- ▶ A little bit yes.

Goal Sequencing and Timing

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

- ▶ A little bit yes.
 - ▶ With a given score taken as read, you'd rather be the team who scored most recently.

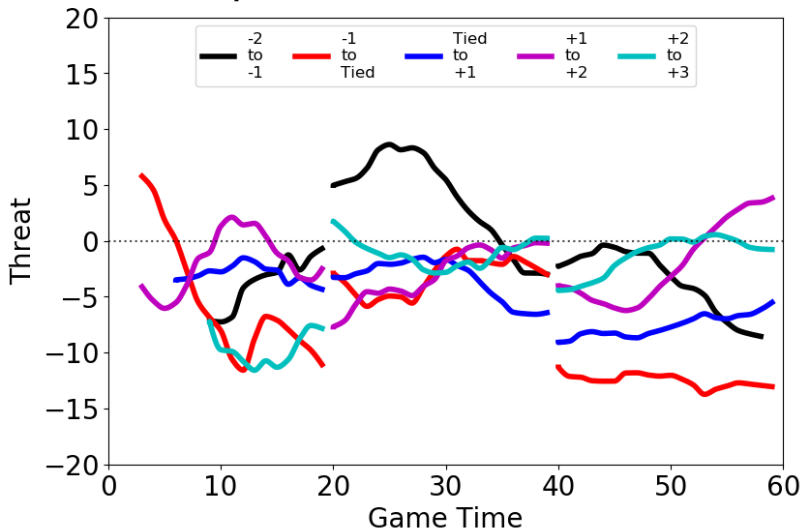
Most-recent-goal Advantage



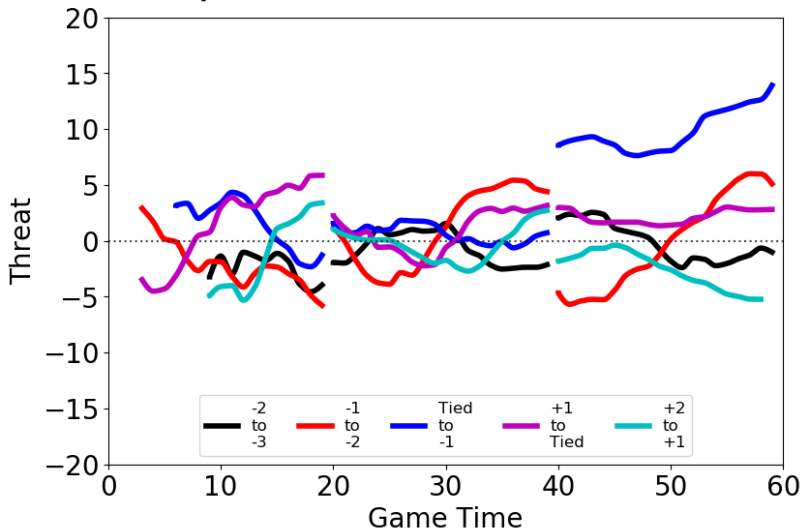
Immediate Goal Impact

By comparing score terms, we can see how teams *respond* to goals, for or against.

Impact of a Goal Scored



Impact of a Goal Conceded



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!

