Pressure

Micah Blake McCurdy
micah@hockeyviz.com

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Pressure

- Does pressure vary over the course of a hockey game?
- Do certain players play under more pressure than others?
- If so, is this because of coaching decisions?
- Do some players perform better under pressure than others?

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    - **Yes.**
- Do certain players play under more pressure than others?
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- If so, is this because of coaching decisions?
    - **Yes.**
- Do some players perform better under pressure than others?
    - **I don't know yet.**

Outline

- Expected Points model.
- Pressure comes mostly from icetime.
- Deployment varies significantly after controlling for icetime.

Pressure Definition

- *Defensive* Pressure is how much you lose if you're scored on.
- *Offensive* Pressure is how much you gain if you score.

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  - **(Expected) Standings points lost.**
- *Offensive* Pressure is how much you gain if you score.
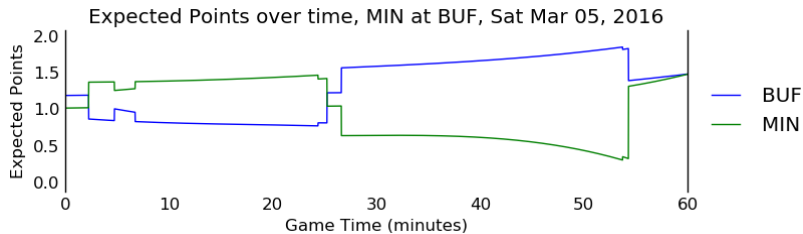 - **(Expected) Standings points gained.**

Expected Points

Philadelphia Routs Columbus 6-0

Expected Points over time, CBJ at PHI, Sat Mar 05, 2016
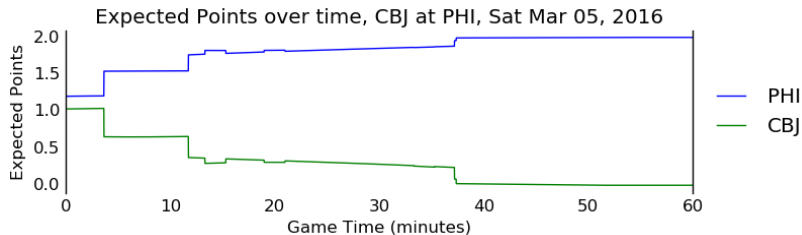
Goals in 4th, 12th, 38th, 38th, 51st, 51st minutes.

Expected Points

Minnesota Buffalo 2-2 with shootout.

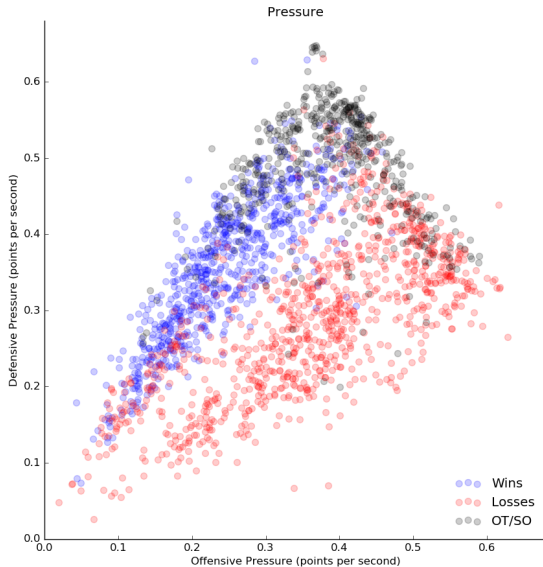Expected Points over time, MIN at BUF, Sat Mar 05, 2016
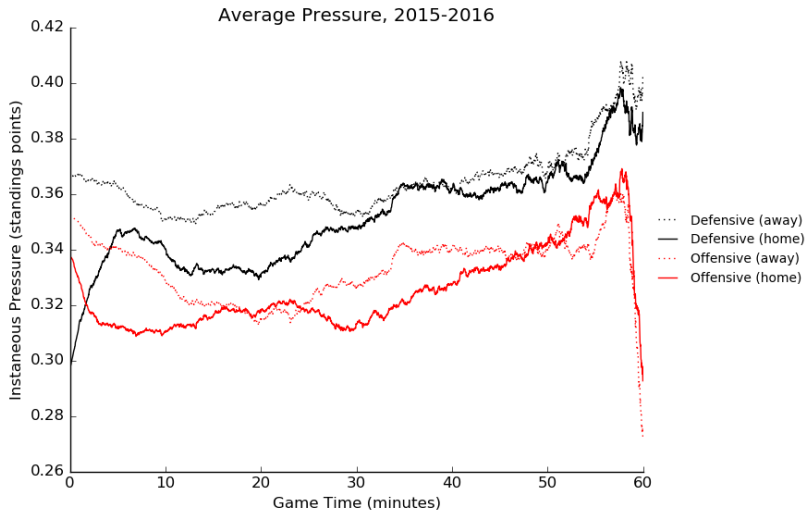
Model Definition

For a given:

- ▶ Home Score
- ▶ Away Score
- ▶ Home Skater Number
- ▶ Away Skater Number

Fit a pair of cubics which are constrained to end at the right place. Also various other shenanigans.

Game Pressures

Pressure

Pressure Over Time
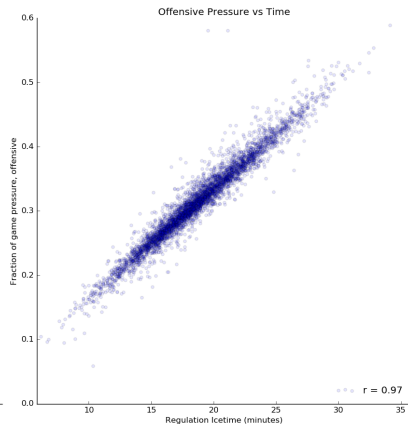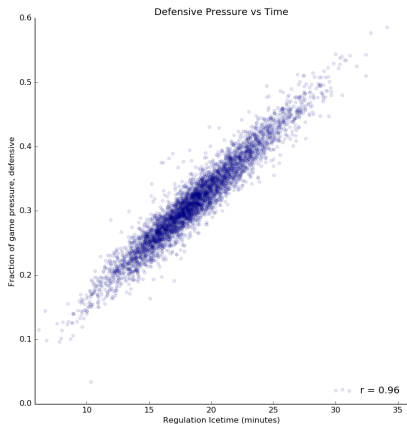

Average Pressure, 2015-2016

Incentives

Road teams, on average, are rewarded less for scoring than they are punished for being scored on *at all times*.

For home teams the same is true except for the first two (!) minutes.
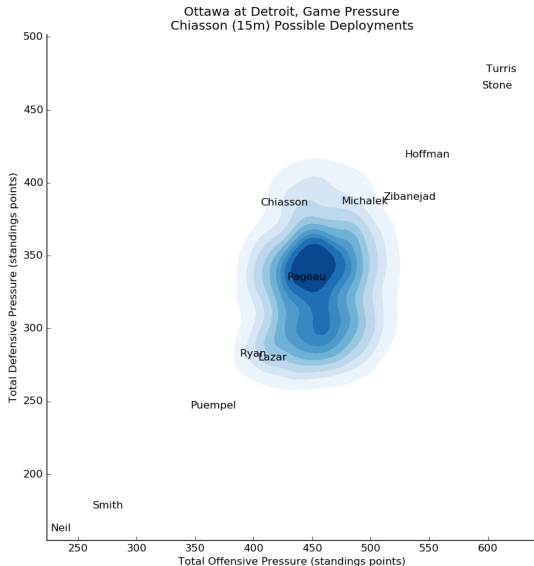
Pressure is Mostly Icetime

Random Distribution of Shifts

Consider "randomly" distributing a given player's icetime within a game, keeping the total constant, to give an idea of how much choice coaches have.

Possible Pressure for Chiasson vs Boston, Nov 16, 2015

Ottawa at Detroit, Game Pressure
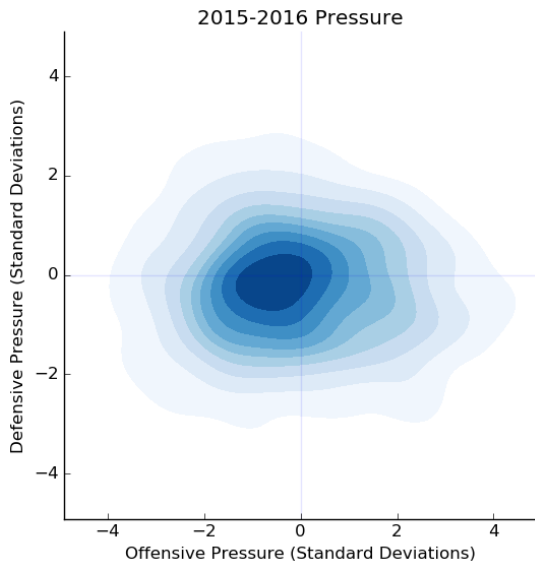Chiasson (15m) Possible Deployments

Aggregate z-scores

Aggregate all of the deviations-from-expected:

$$z = \frac{1}{\sqrt{|I|}} \sum_{i \in I} z_i$$

and test for normality:

- Offence $p = 0.058$
- Defence $p = 0.004$

Distribution of coaching choices

2015-2016 Pressure

Pattern of coaching choices

Coaching adjustments to pressure are more about sheltering weak players than deliberately using strong players in high pressure situations.

High Offensive Pressure Players

Player	Standard Deviations	
	Offensive Pressure	Defensive Pressure
Ribeiro	4.9	-1.8
Hudler	4.6	0.0
Gaudreau	4.4	-0.6
Landeskog	4.2	-0.7

High Defensive Pressure Players

| Player | Standard Deviations | |
	Offensive Pressure	Defensive Pressure
DeKeyser	-0.2	4.1
Hjalmarsson	-1.0	4.1
Methot	-1.2	3.8
Larsson	-1.7	3.8

Most extreme usages

Player	Standard Deviations Offensive Pressure	Defensive Pressure
Gostisbehere	+4.1	-4.3
Suter	+3.5	+1.6
Nick Schultz	-3.5	+2.7
Max Talbot	-3.4	-3.3

Future Work

- Do some players play *better* under pressure?
- Expand to include regular season and playoffs.

Thanks!