Goalie Brouhaha

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Goals

A framework for evaluating goalies which is:

- Fair
- Simple
- Extensible
- Actionable
- Repeatable

States of Play

Idea: break down defensive-zone play into discrete states.

- Shot
- Freeze
- Contested
- Goal
- Attackers
- Defenders
- Safe

Transition Matrix

	Shot	Freeze	Contested	Goal	Attackers	Defenders	Safe
Shot	?	?	?	?			
Freeze					*	*	*
Contested					*	*	
Goal				100%			
Attackers	*		*				
Defenders			*				*
Safe							100%

? Primarily goaltender-driven

* Primarily skater-driven

Transition Matrix

League-wide, 2016-2017

	Shot	Freeze	Contested	Goal	Attackers	Defenders	Safe
Shot	21.1%	25.7%	47.7%	5.5%			
Freeze					49%	49%	2%
Contested					41%	59%	
Goal				100%			
Attackers	46%		54%				
Defenders			35%				65%
Safe							100%

Transition Matrix

Philipp Grubauer, 2016-2017, 24 gp, Washington

	Shot	Freeze	Contested	Goal	Attackers	Defenders	Safe
Shot	19.2%	25.4%	51.1%	4.3%			
Freeze					51%	46%	3%
Contested					38%	62%	
Goal				100%			
Attackers	43%		57%				
Defenders			32%				68%
Safe							100%

Transition Matrix

Mike Smith, 2016-2017, 55 gp, Arizona

	Shot	Freeze	Contested	Goal	Attackers	Defenders	Safe
Shot	22.1%	28.8%	44.1%	5.0%			
Freeze					49%	48%	3%
Contested					43%	57%	
Goal				100%			
Attackers	52%		48%				
Defenders			36%				64%
Safe							100%

Grubauer vs Smith

Goal probability per 100 unblocked shots, adjusting for skaters

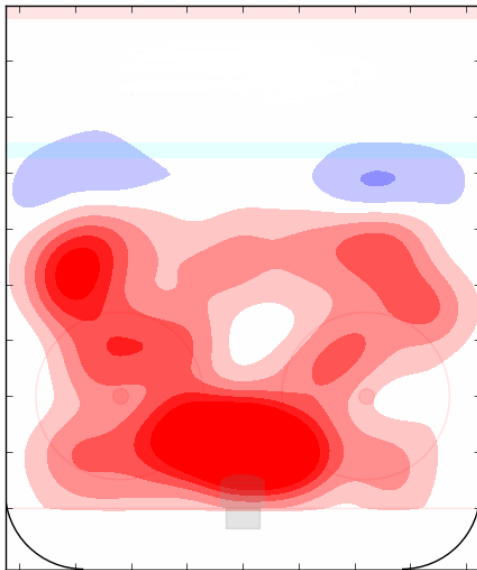|		Grubauer	Smith
	Immediately	4.3	5.0
	Eventually	7.4	10.2
Skater-Independent	Eventually	7.9	9.5

Shot Locations

Devan Dubnyk, 2016-2017, 65 gp, Minnesota
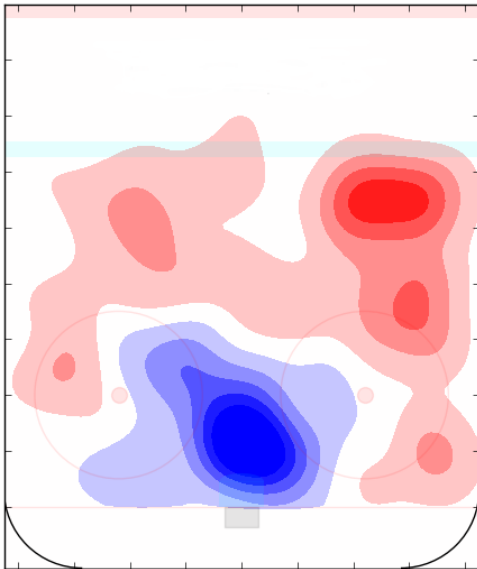
Shot Locations

Mike Smith, 2016-2017, 55 gp, Arizona

Dubnyk vs Smith

Goal Probability per 100 unblocked shots, adjusting for shot locations

Standardized?			Dubnyk	Smith
	Immediately		5.1	5.0
Shots	Immediately	(sGA)	6.1	4.6
Skaters	Eventually	(sGA*)	8.0	7.8
Shots & Skaters	Eventually		10.1	10.9

Repeatability

- All goalies back to the start of 2007-2008
- Split goaltender career into 25-game chunks
- Correlate
  - Career-to-date values
  - Following 25 games

Stat	Correlation
sGA	0.185
Skater-Independent sGA*	0.135
xGA-GA per shot	0.211
All-situations save %	0.211
5v5 save %	0.115

Future Work

- Non-trivial priors.
- Careful dissection of qualitatively different shot types.
- Vision and pre-shot movement.
- Discriminate based on zone entry.

Thanks!