Meet the Team!

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Executive Summary

1. Hockey-Graphs/Canucks Army Data Sprint
2. Acknowledgements
3. Background on the data
4. Even Strength VS Power Play
5. Definitions
6. Key Results
7. Limitations

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Origin: Hockey Data Sprint

Acknowledgements

Special thanks to HockeyData for making the data used for the results in this presentation available to us - http://www.hockeydata.com/

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Work based on results of Arik Parnass

Thanks again to Josh Weissbock, the Vancouver Canucks, SFU Big Data Hub, SFU Sports Analytics Club, Hockey Graphs, Canucks Army

Thanks to WAR-ON-ICE.COM and Sam Ventura for the public plotting code

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"Real data is **sometimes** available, **rarely** has the variables you need, and is **never** perfect"

-probably every sports analyst ever

Data from HockeyData

Thank you to HockeyData for sponsoring the Data Sprint and for providing us with the data!

- 198 AHL Games between Oct 14th 2016 and Jan 28th 2017
- 14 Eastern Conference Teams
- Tagged Events (Shots, Blocked Shots, Missed Shots, Goals, Zone Entries/Exits, Hits, Turnovers etc.)
- 1343 unique 5 on 4 power plays from minor penalties
- 2217 minutes of power play time

Even Strength VS Power Play
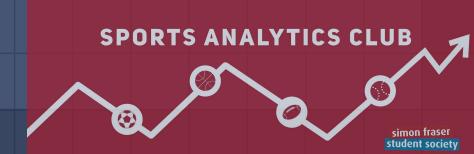
Even Strength
- Not as concerned about time
    - Game situation dependent
- Offensive and defensive responsibilities
    - Possession highly contested

Power Play
- Limited duration
    - Maximize time in Offensive Zone
- More control of the play
    - Structured

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Goals of Analyzing the Power Play
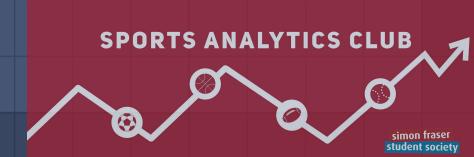
- Focus on structured elements of the Power Play
    - Can breaking structure lead to better results?
- Take advantage of the limited Power Play time
- Concentrate on zone entries
- Explore longer and controlled vs shorter and potentially riskier breakouts

Neutral Zone Regroup Decision

When the Power Play team recovers the puck in the Neutral Zone, Power Play teams must decide between

1. Immediately trying to re-enter the offensive zone
2. Bringing the puck back to their defensive zone to fully regroup and perform a structured offensive zone entry attempt
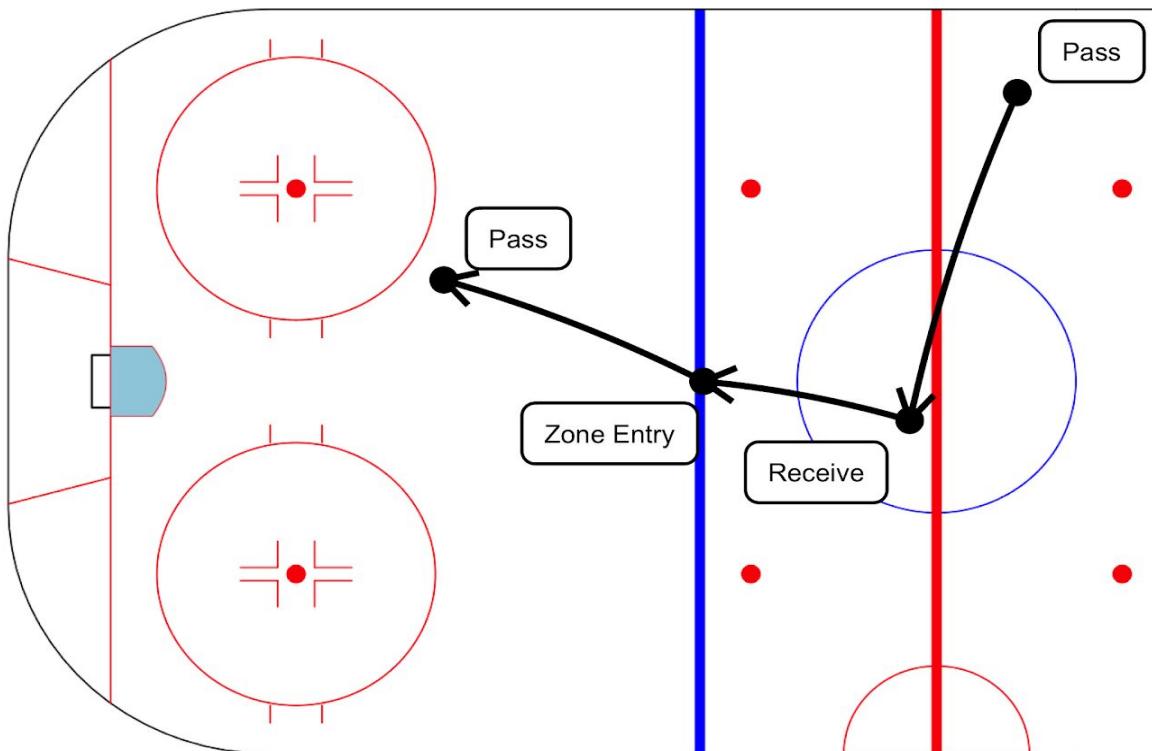
Immediate Zone Re-Entry

Immediate Zone Re-Entry

Benefits:
- **Quicker, gain valuable seconds in offensive zone**
- **Catch Shorthanded team before or during shift change**

Drawbacks:
- **Less structure**
- **Higher risk of failing**
- **Less speed generated into the offensive zone**

Full Regroup
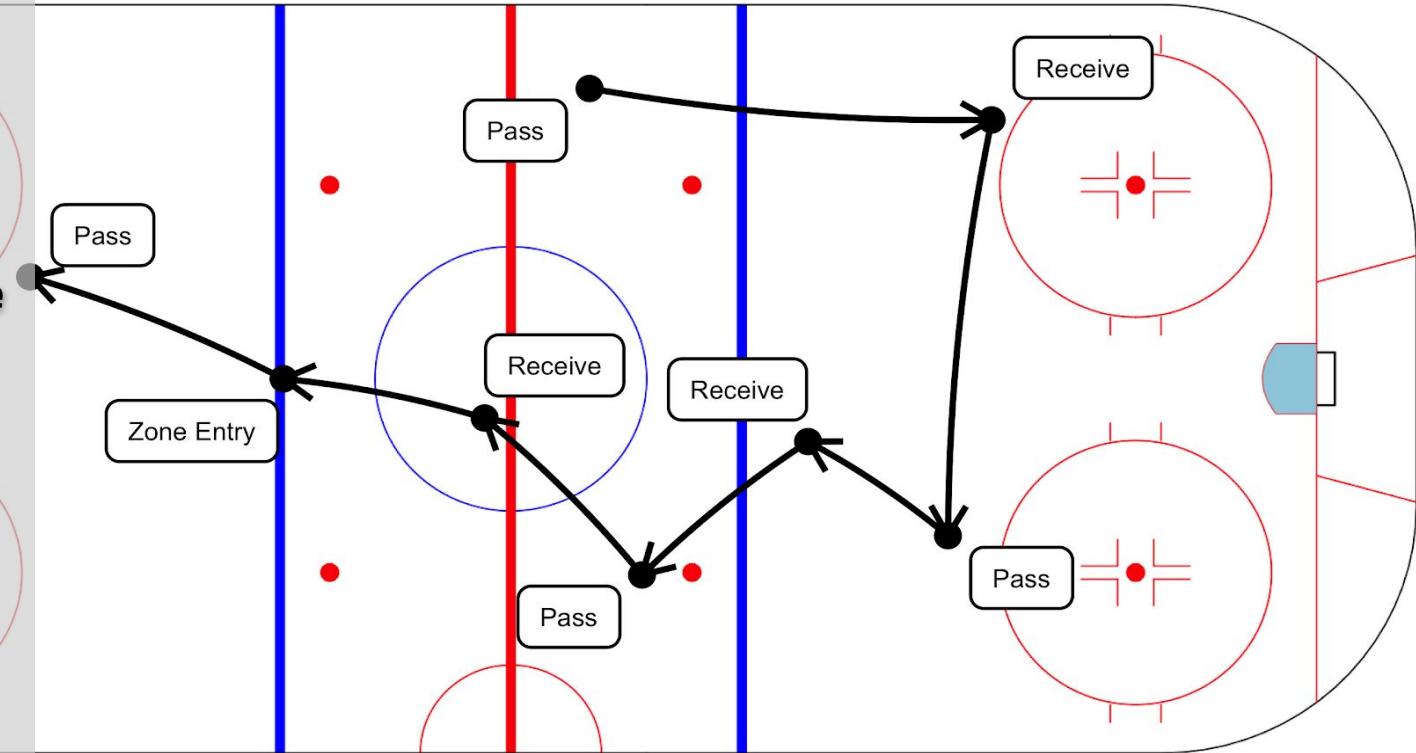
Full Regroup

Benefits:
- **Structured, creates high quality chance on zone-entry**
- **Spreads defenders**
- **PP team can change lines**

Drawbacks:
- **Time consuming**
- **Lose pressure**
- **Shorthanded team can change lines**

Neutral Zone Regroup Definition

A Neutral Zone Regroup begins when one of the following happens:

Situation 1:
- Previous tagged event was in the Offensive Zone
- Power Play team has possession in the Neutral Zone for the current event

Situation 2:
- Previous tagged event was in Neutral Zone, Short Handed team had possession
- Power Play team has possession in the Neutral Zone for the current event
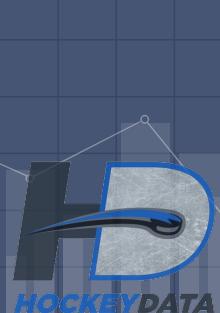
This occurs 826 times in our data, about every three minutes of Power Play time

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Immediate and Full Regroup Definitions

Immediate Regroup (n = 511)

We see a zone entry event attempt or Offensive Zone event before we see an event by the Power Play Team in the Defensive Zone

Full Regroup (n = 315)

We see an event by the Power Play Team in the Defensive Zone before we see a zone entry event attempt or an event in the Offensive Zone

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How we define Expected Time and why?

Initial Zone Entry Attempt

Immediate Regroup Attempt

Puck Recovered in Neutral Zone

Initial Zone Entry Attempt

Full Regroup Attempt

Puck Recovered in Neutral Zone

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How we define Expected Time and why?

Immediate Regroup Attempt

Initial Zone
Entry Attempt

Puck
Recovered in
Neutral Zone

Offensive
Zone Entered

Full Regroup Attempt

Initial Zone
Entry Attempt

Puck
Recovered in
Neutral Zone

Offensive
Zone Entered

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How we define Expected Time and why?

Immediate Regroup Attempt

Initial Zone
Entry Attempt

Offensive Zone
Exited

Puck
Recovered in
Neutral Zone

Offensive
Zone Entered

Full Regroup Attempt

Initial Zone
Entry Attempt

Offensive Zone
Exited

Puck
Recovered in
Neutral Zone

Offensive
Zone Entered

Key Results

Expected Value Per Minute of PP Given Regroup Decision

Regroup ■ Full ■ Immediate

Expected Value Per Minute of PP Given Regroup Decision

Reproducibility

Even
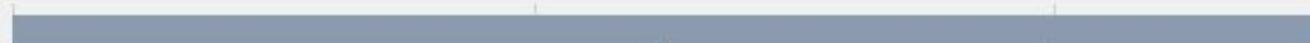
Odd
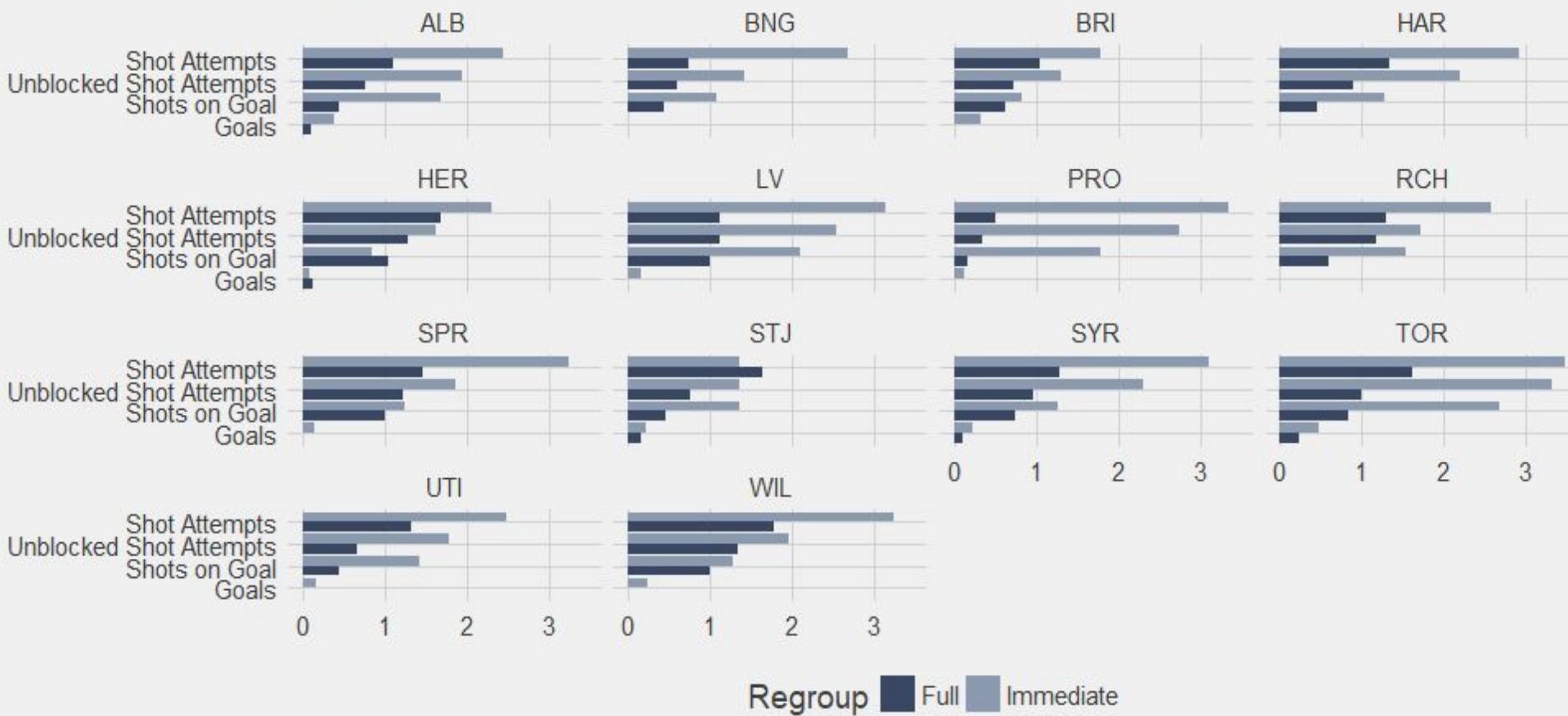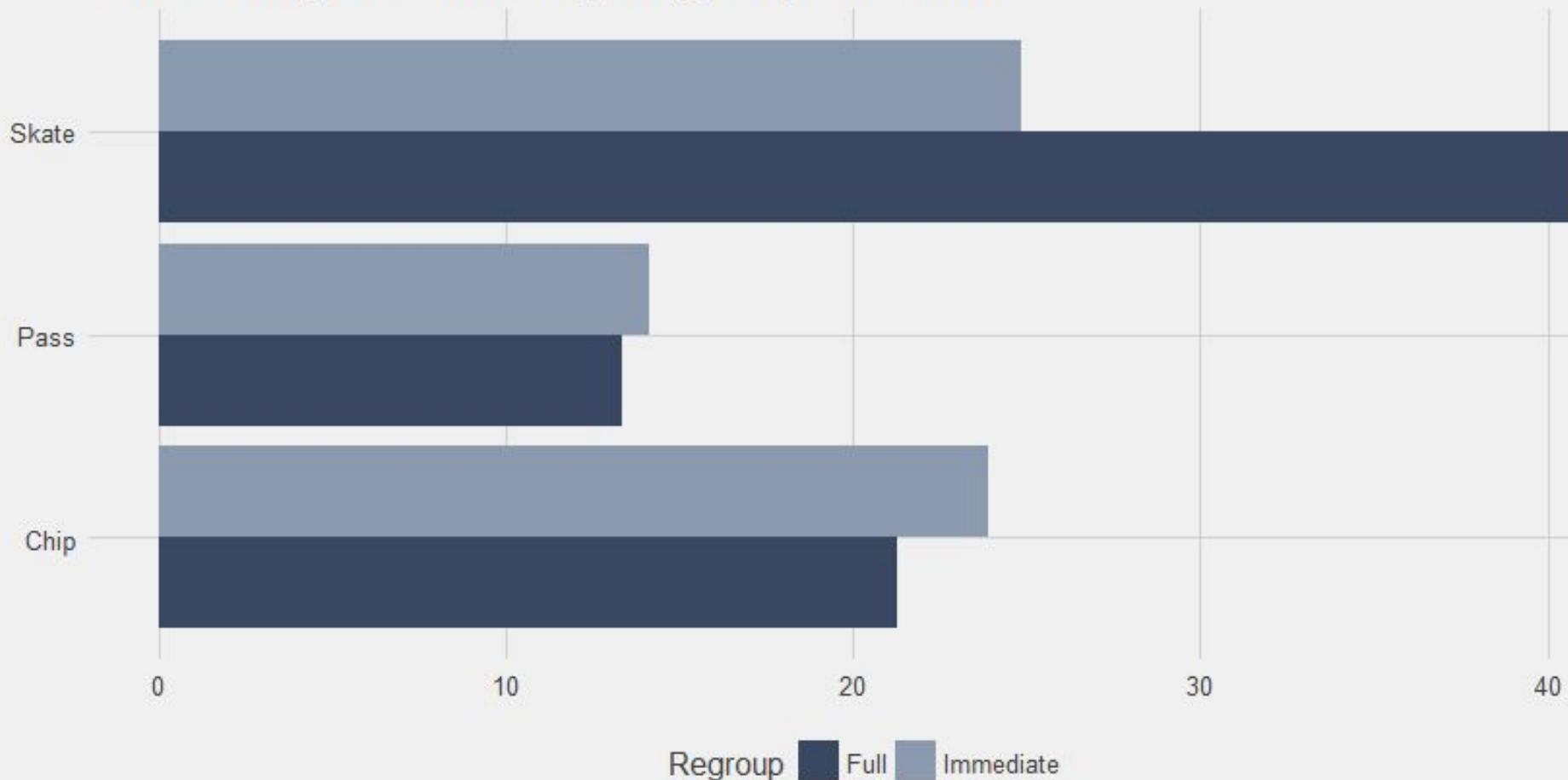
Regroup ■ Full ■ Immediate

Expected Value Per Minute of PP Given Regroup Decision

Team Level

Regroup: Full, Immediate

Zone Entry Methods by Regroup Decision

Expected Time

Average Time = 2.77 s

Immediate Re-Entry Attempt Example

Initial Zone Entry Attempt

Offensive Zone Exited

Average duration: 12.14 s

Puck Recovered in Neutral Zone

Offensive Zone Entered
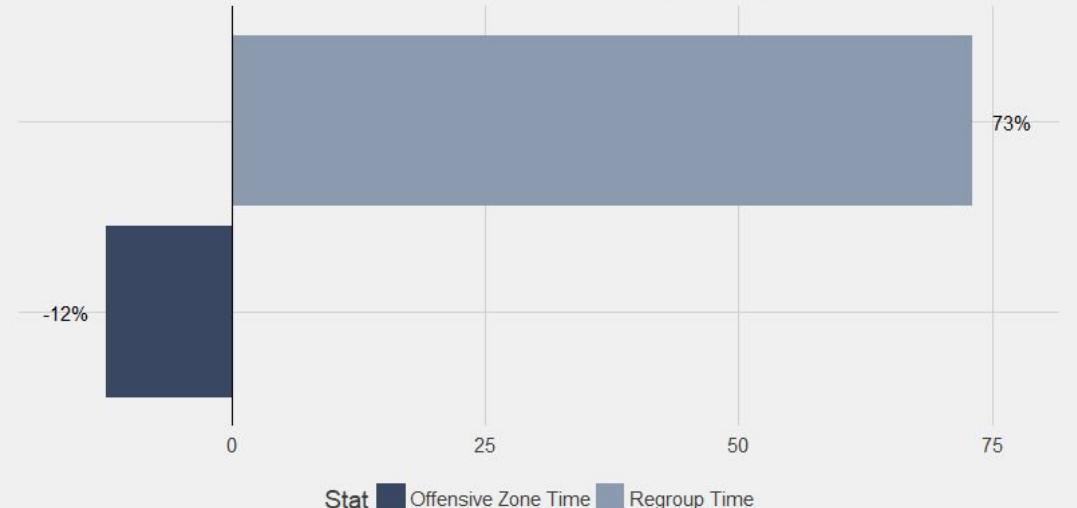
Full Regroup Attempt Example

Initial Zone Entry Attempt

Offensive Zone Exited

20.95 s

Puck Recovered in Neutral Zone

Offensive Zone Entered

Average Time = 10.26 s

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Time Tradeoff

Metric	Full	Immediate
Offensive Zone Time (seconds)	10.69	9.37
Regroup Time (seconds)	10.26	2.77

Percentage of Expected Time Gained by Immediate Entry

-12%

73%

Stat ■ Offensive Zone Time ■ Regroup Time
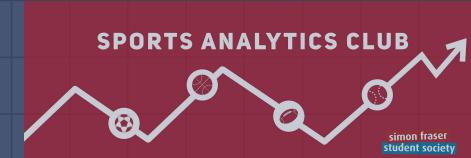
Takeaways – It's not as risky as you think

Look to be more Aggressive ➤ **Take Context Into Account** ➤ **Manage the Team**

- Time to regroup and start new breakout for a full regroup is not worth it

- Context on the ice is more important than numbers
- Tired players stuck on the powerplay is not ideal
- Full regroup still has benefits
- Offsides should be avoided

- Individual teams may be more skilled in immediate or full zone regroup
- More research can help make this decision in the future

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Limitations

1. Data Definitions that represent the problem correctly

2. Tagged data inherently misses out on time as it is not continuous

Future Work

1. Gather more data for more reliable estimates
2. Shift changes punished
3. Apply methodology to NHL
4. Gain Coaches, Players and Other Analytic Perspectives

Any questions?

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