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Mortality risk and social network position in southern resident killer whales (*Orcinus orca*): sex differences and the importance of salmon abundance

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Speaker

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Mortality Risk and Social Network Position in Resident killer Whales

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Social Life Histories

1. How does the ecological environment shape population social structure?
2. What are the consequences of social structure for patterns of survival and reproduction?
3. What are the evolutionary consequences of social structure (social evolution)?
4. **Future:** How can this information be used to better inform management decisions?

Center for Whale Research: 1976-2018

Over four decades of data collection



1976



2016

Individual Life Histories: J2



1976



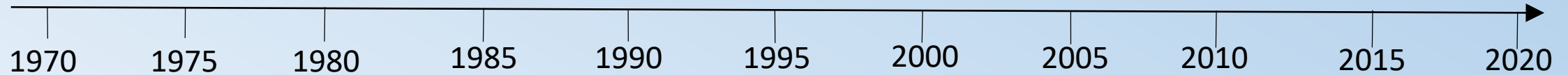
1998



2011



2016



1976



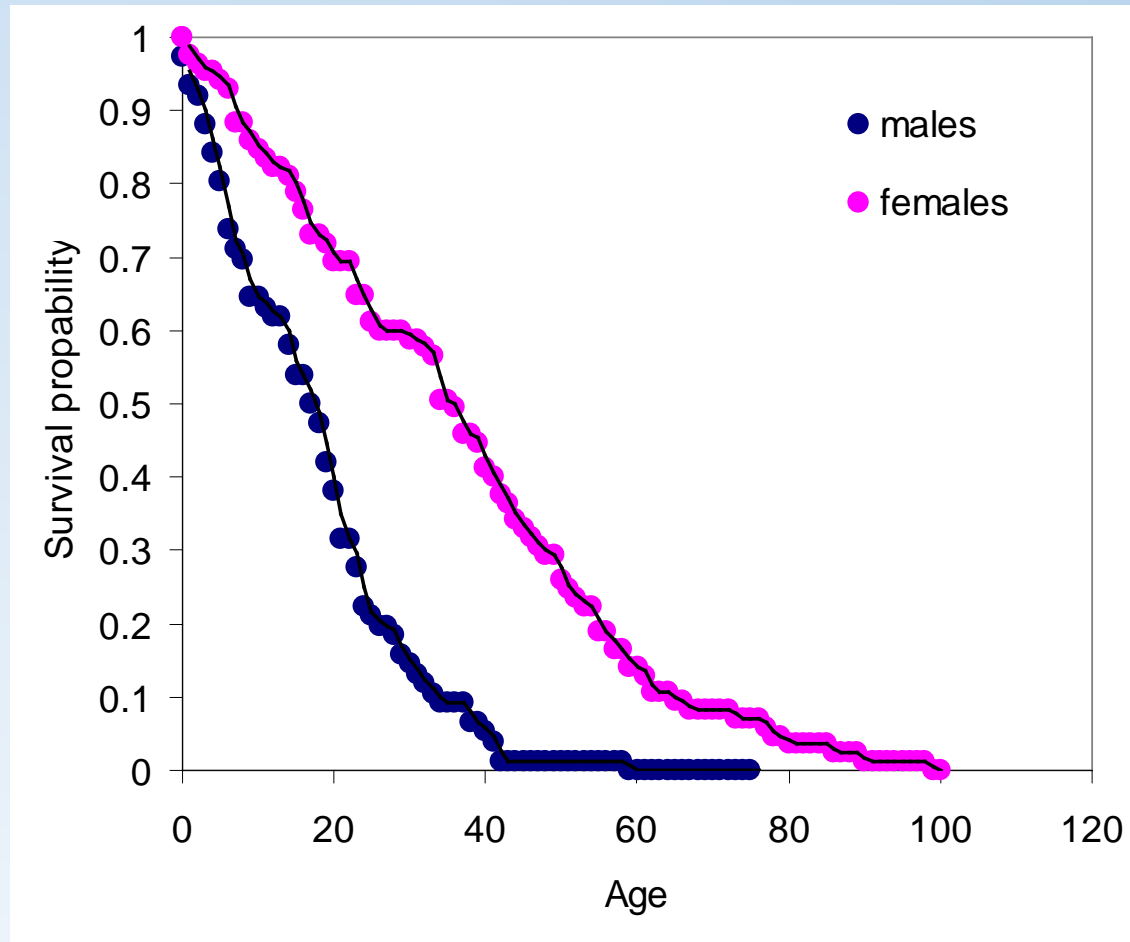
2007



2009

↑
**Missing
Oct 2016,
declared
dead Jan
2017**

Sex Differences in Life History



Sex Differences in Social Life History

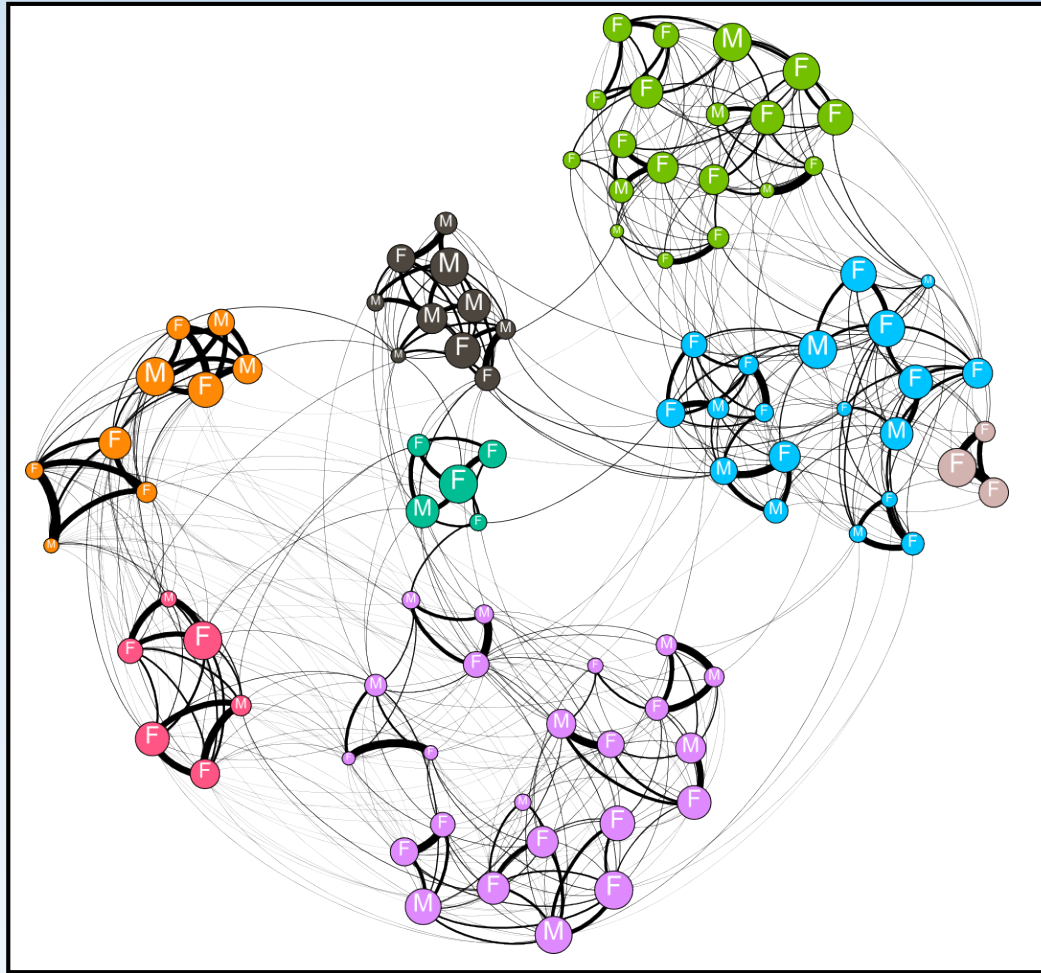


Adult males are dependent on their mothers for survival.

What about social relationships within the wider social group?



Social Networks as a Tool for Quantifying Social Position



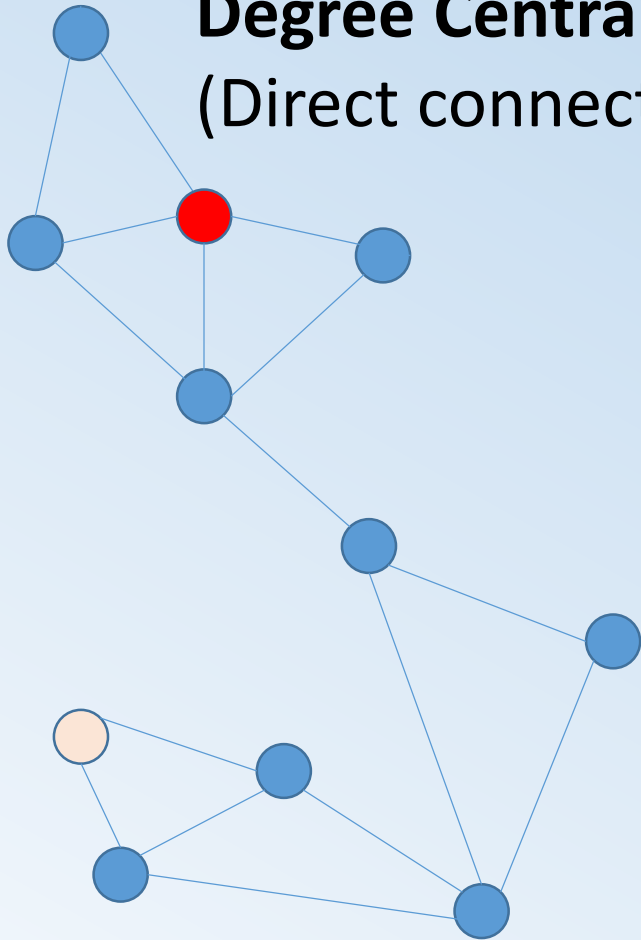
1976 - 2010

■



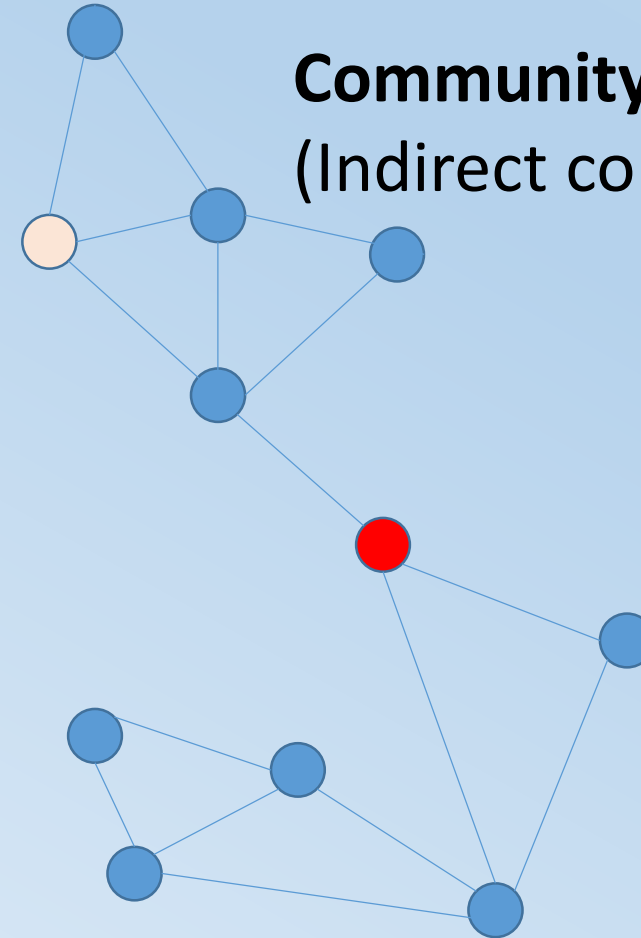
Measuring Social Position

Degree Centrality
(Direct connections)

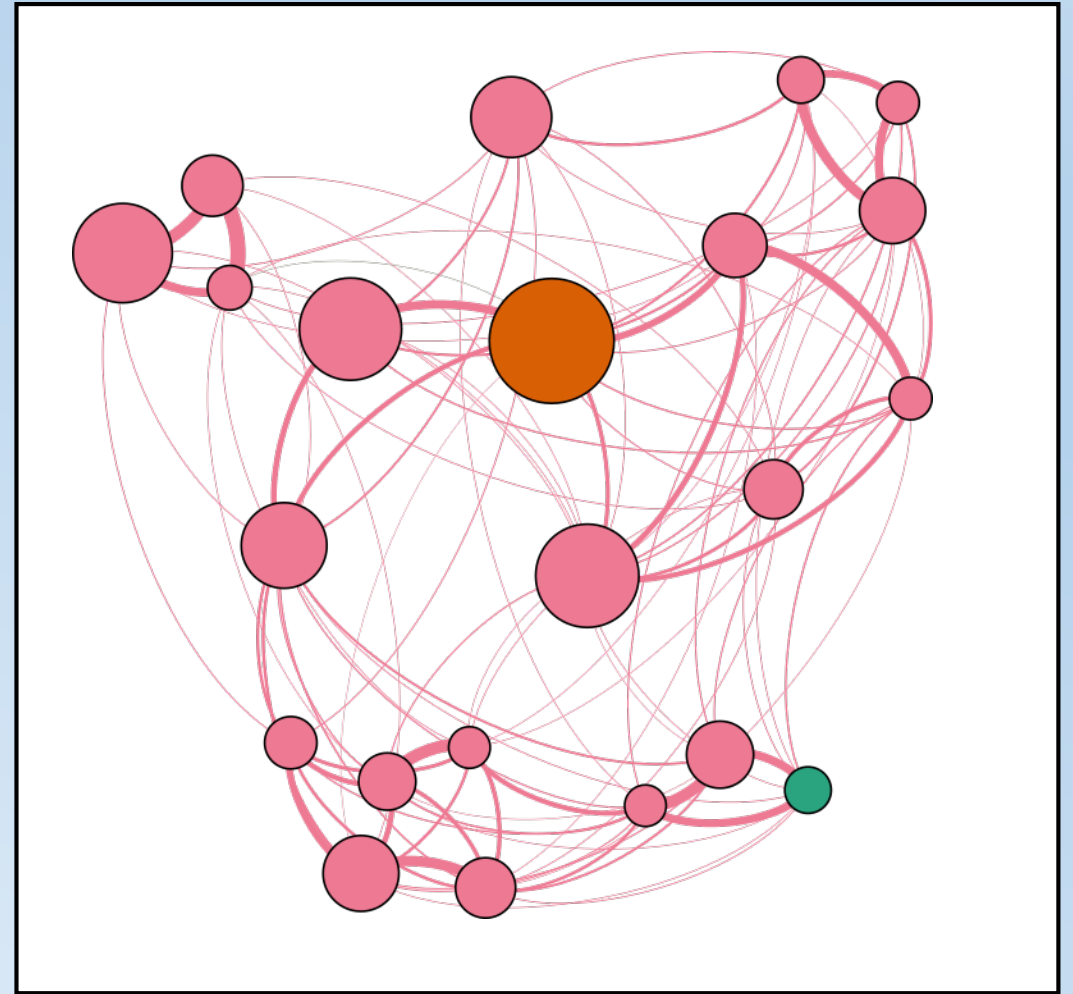
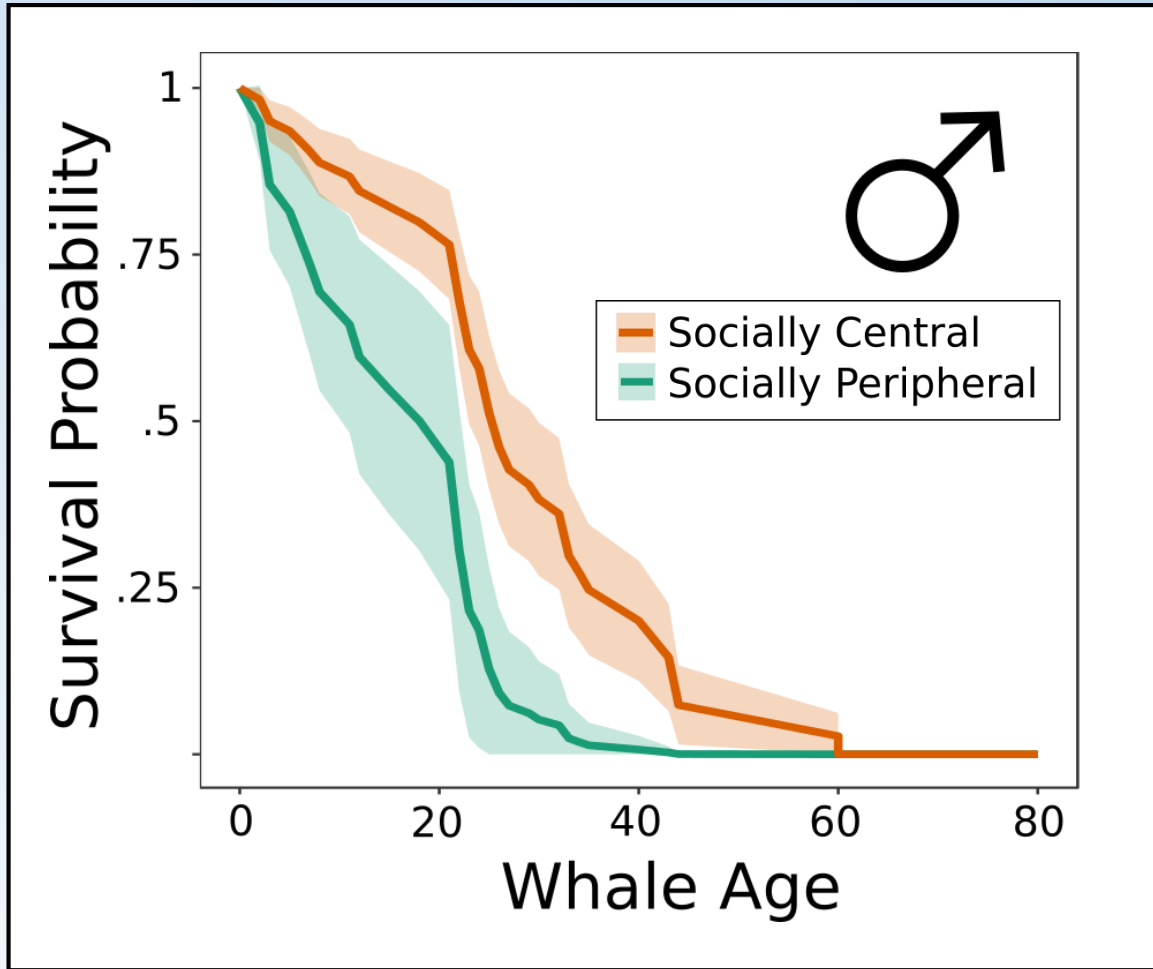


● High ● Low

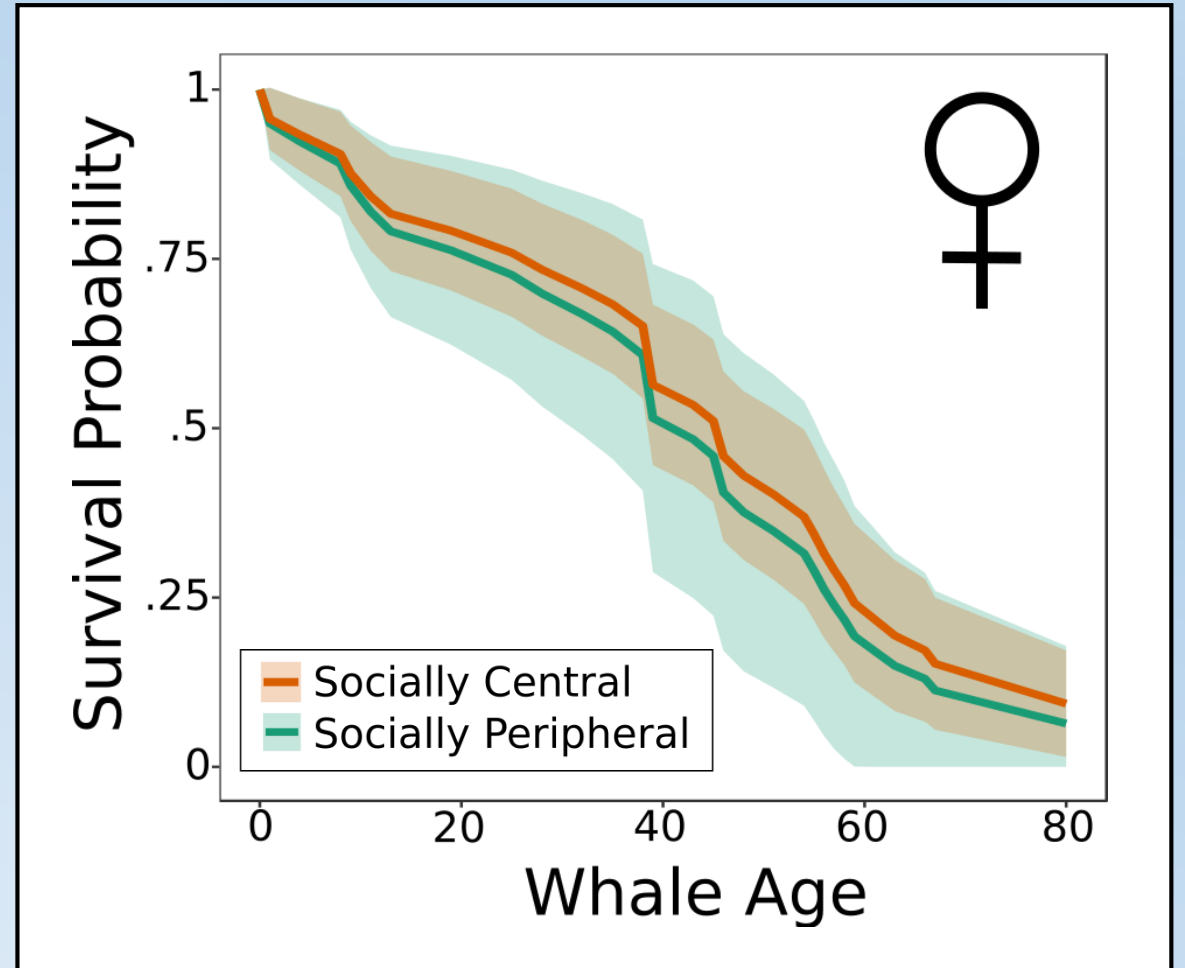
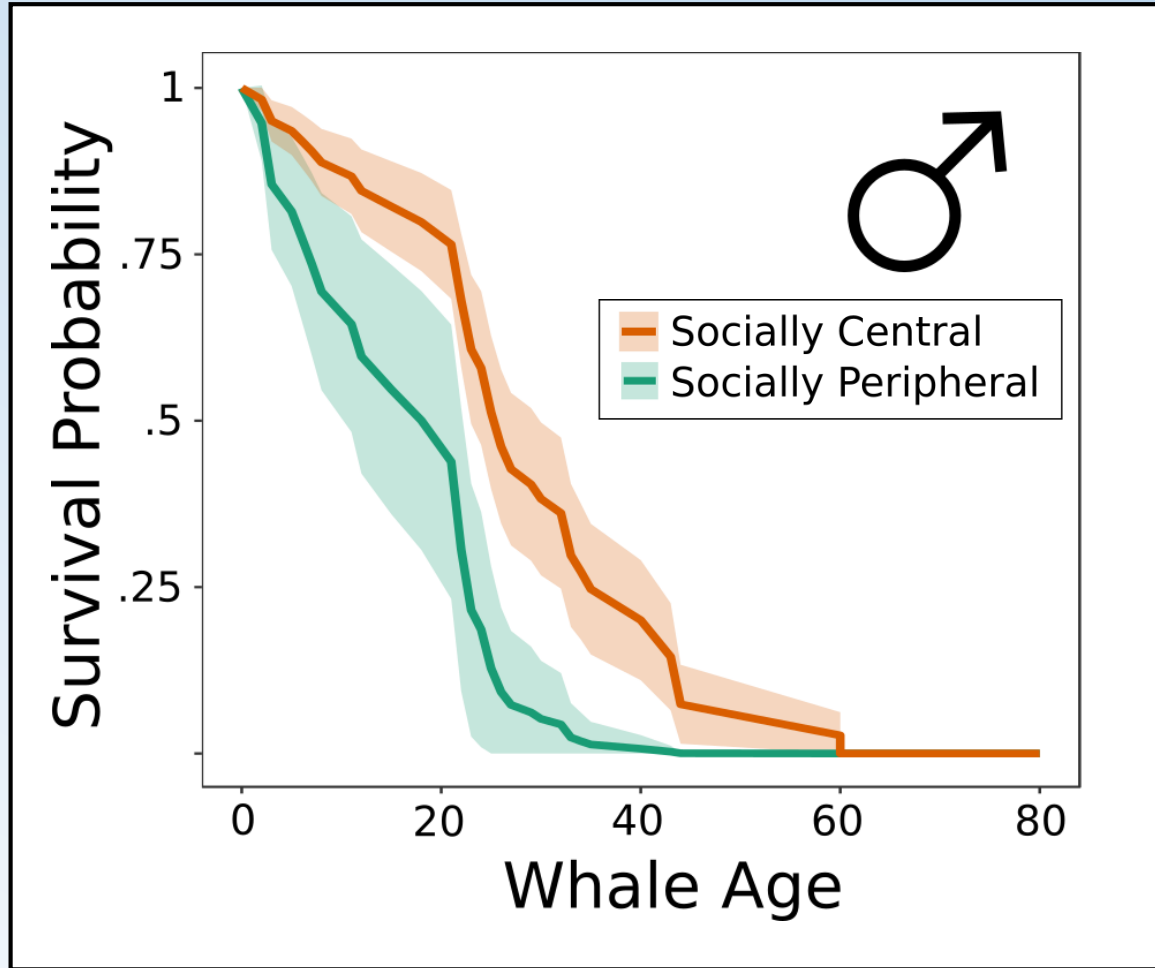
Community Centrality
(Indirect connections)



Social Position and Survival in Male Killer Whales

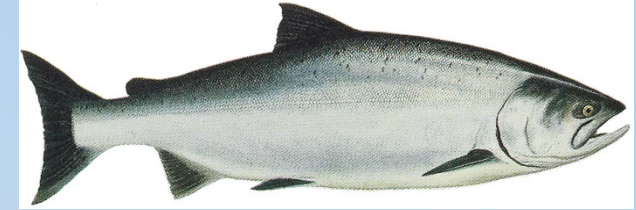
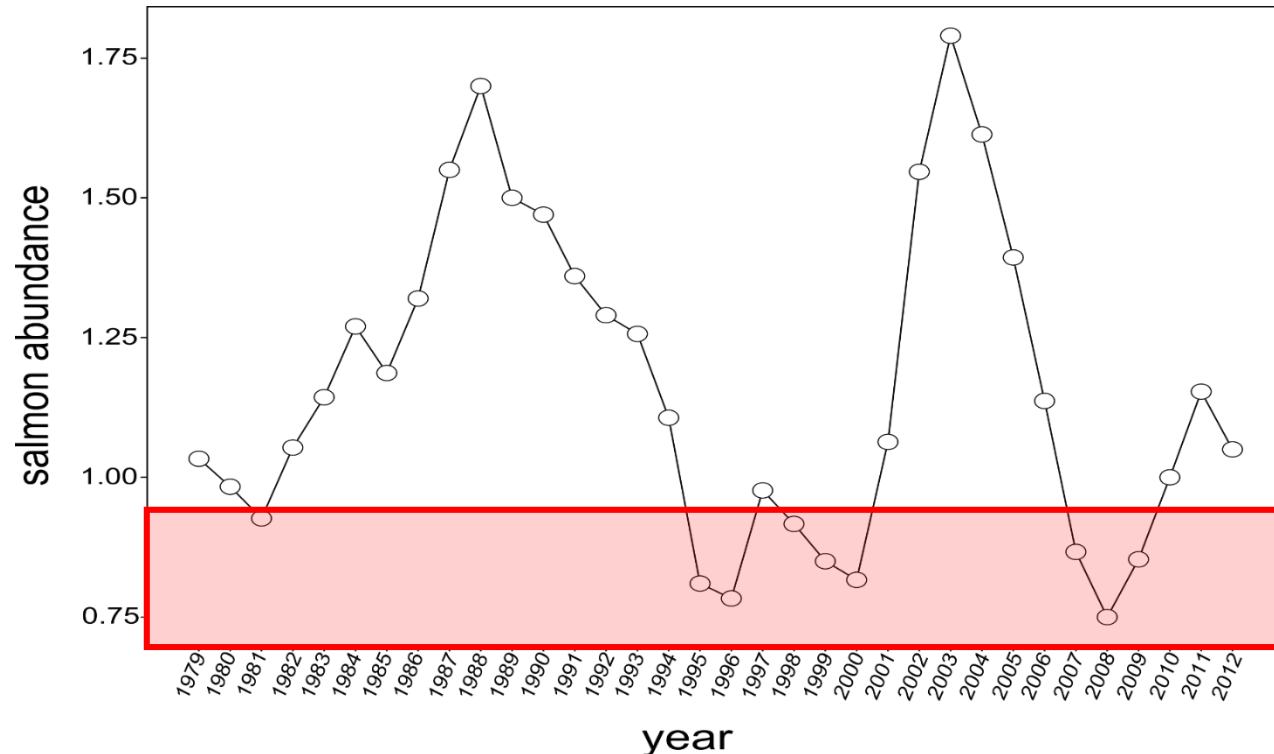


Sex Differences in Social Position and Survival



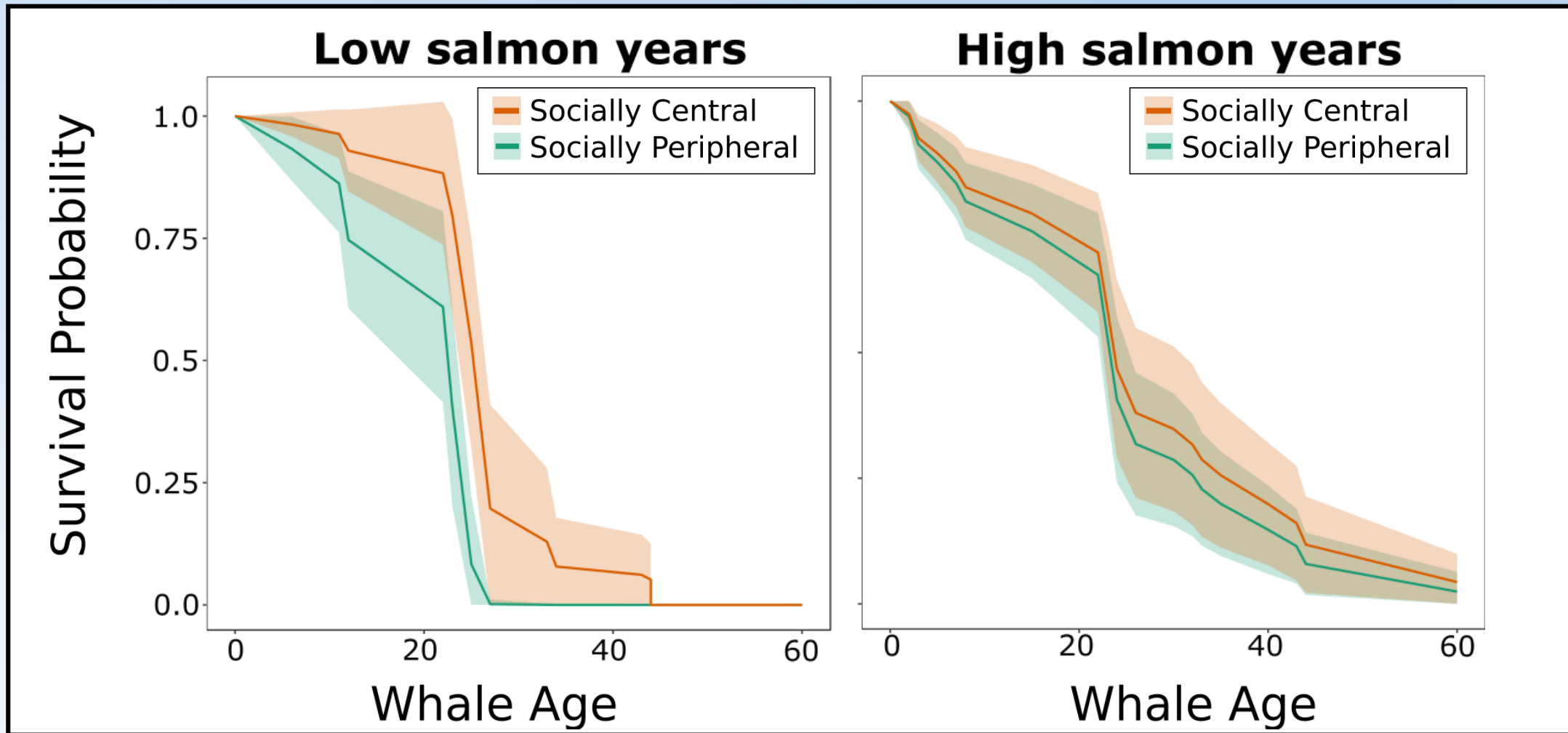
Sociality, Survival and the Ecological Environment

Estimated chinook salmon abundance



Approximately half of all whale deaths occur in years with the lowest quartile of salmon abundance

Sociality, Survival and the Ecological Environment



Conclusions

1. The survival of male, but not female, southern resident killer whales is significantly related to their social position in their local community.

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3. S
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The image shows the cover of the journal 'Animal Behaviour'. On the left is the Elsevier logo, which features a tree with a person standing next to it. In the center, the text reads 'Contents lists available at SciVerse ScienceDirect' above the journal title 'Animal Behaviour'. Below the title is the journal homepage URL: 'www.elsevier.com/locate/anbehav'. On the right is a small thumbnail image of the journal cover, which depicts a colorful scene of animals in a natural setting.

Social network correlates of food availability in an endangered population of killer whales, *Orcinus orca*

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Future Work: Social Life Histories

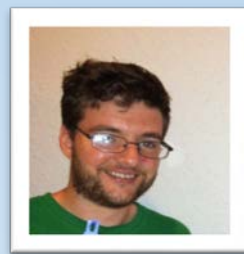




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Research



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Mortality risk and social network position in resident killer whales: sex differences and the importance of resource abundance

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