

# Promoting use of best practices for survival of released catch: the power of subjective norms

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# Promoting survival of released catches

- There are many actions fishers can take to promote survival of released catches, e.g.
  - Release practices
  - Gear choice
- Often, such actions involve costs or inconvenience and adoption is rarely universal
- Need to understand motivations for use in order to promote adoption

Example: promoting survival of reef fish through barotrauma mitigation



Photo: Florida Sea Grant



## Venting Tools



## Fish Descending Gear



Photos: Florida Sea Grant





# CATCH & RELEASE FISHING

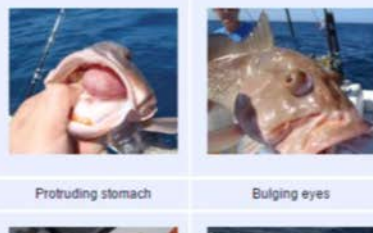
Photo courtesy Florida Fish and Wildlife Conservation Commission

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## Descending

NEW VIDEO

## Venting



Protruding stomach

Bulging eyes

# Florida Sea Grant



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## Fisheries

Home Fisheries Venting: A Guide to Releasing Reef Fish with Ruptured Swimbladders

Artificial Reefs

Regional Workshops

Caribbean

## Venting: A Guide to Releasing Reef Fish with Ruptured Swimbladders

## Get that Fish Down

The science of barotrauma and deep-water release tools



Florida Sea Grant For-Hire Workshop  
October 21, 2014  
Miami, FL



UF IFAS Extension  
UNIVERSITY OF FLORIDA



## WATER RELEASE

Release of fish caught in deep water can be a challenge. Fish from deeper water undergo expansion of gases in their swim bladder and other physical damage to the fish, resulting in barotrauma. Because the expanded gas is still trapped in the body cavity, it is difficult for the fish to swim back to the bottom on its own.

Signs of barotrauma include protrusion of the stomach from the fish's mouth, bulging eyes, bloated belly, and distended intestines. Different species react differently.

## WILL A FISH NEED YOUR HELP?

When venting and descending devices should only be used when signs of barotrauma are present. Make sure to follow current fishing regulations when deciding which tools to carry on your vessel.

If you see any or all of these signs, the fish will probably need help descending, but sometimes the signs are not readily apparent. Only fish that are unable to swim back down should be subjected to additional handling. If the fish is actively fighting attempting to swim down when it is brought to the surface it may not need help to be descended. Experience will help you make the best decision.



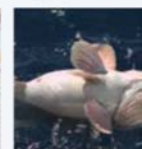
Everted, or protruding stomach



Bulging eyes



Distended intestines



Bloated belly

## DESCENDING AND DESCENDING TOOLS

In recent years a number of descending devices have been developed – some home-made, some manufactured – to descend deep-water fish without having to puncture the body cavity. Though more research is needed, there are indications that descending tools and techniques may greatly increase survival of released fish. A few are shown. This does not imply endorsement of a particular product. The type of device to use is often based on individual angler preference and local fishing conditions.



Pressurized release tool



Weighted milk crate



## VENTING AND VENTING TOOLS

Venting tools are sharpened, hollow instruments that help release expanded gas from the fish body cavity – enabling the fish to swim back to capture depth. A variety of tools are available, however, tools such as a knife or an ice pick are not correct to be venting tools. To vent, insert the tool into the body cavity at a 45-degree angle. Place it under a scale approximately 1/2 inch behind the base of the pectoral fin, just deep enough to release trapped gas.



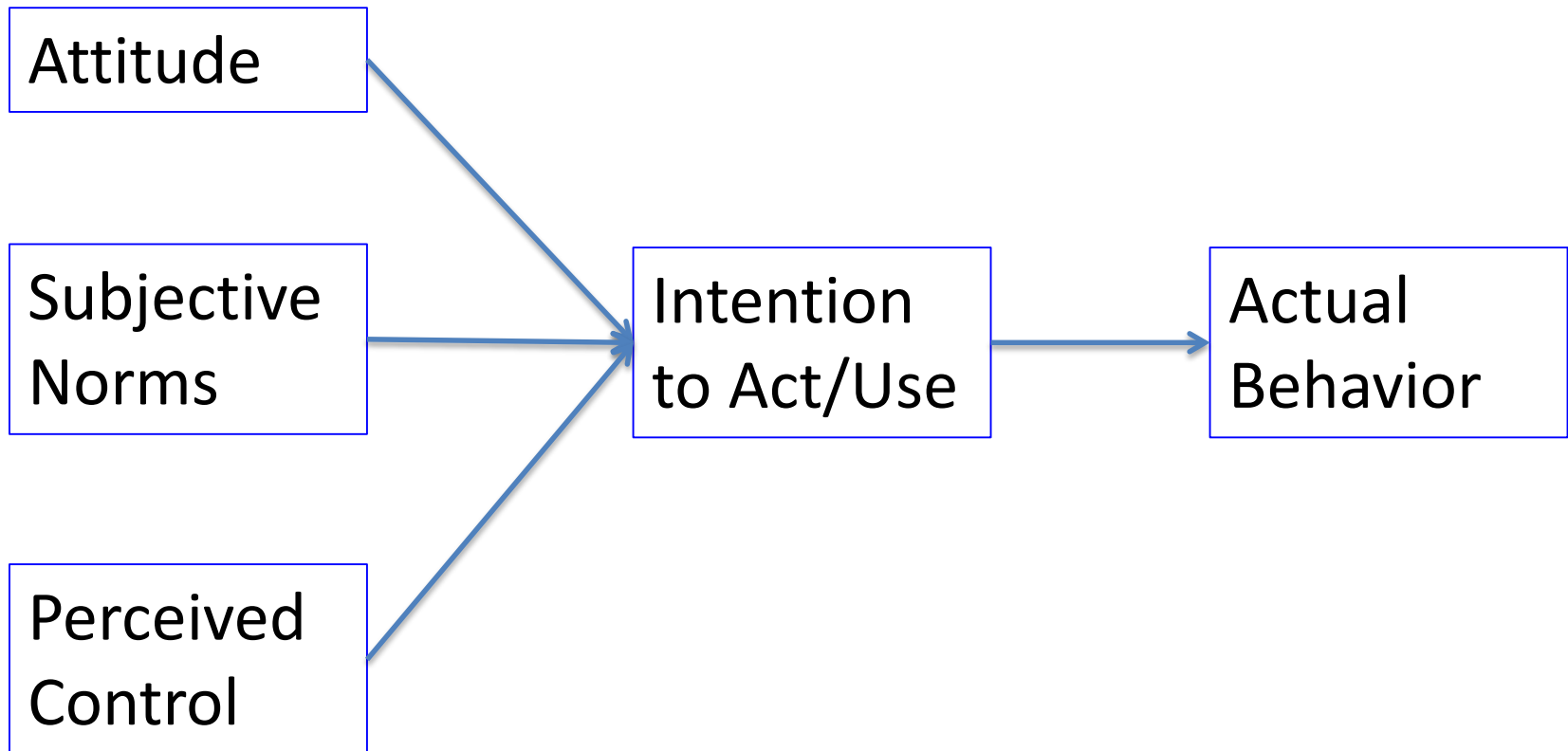
Venting helps release gases that may over-expand in the body cavity.





What could make  
you guys help me  
survive?

# Understanding factors underlying use: Theory of Planned Behavior



# Concepts

## Attitude

- favorable or unfavorable evaluation or appraisal of the behavior

## Subjective norm

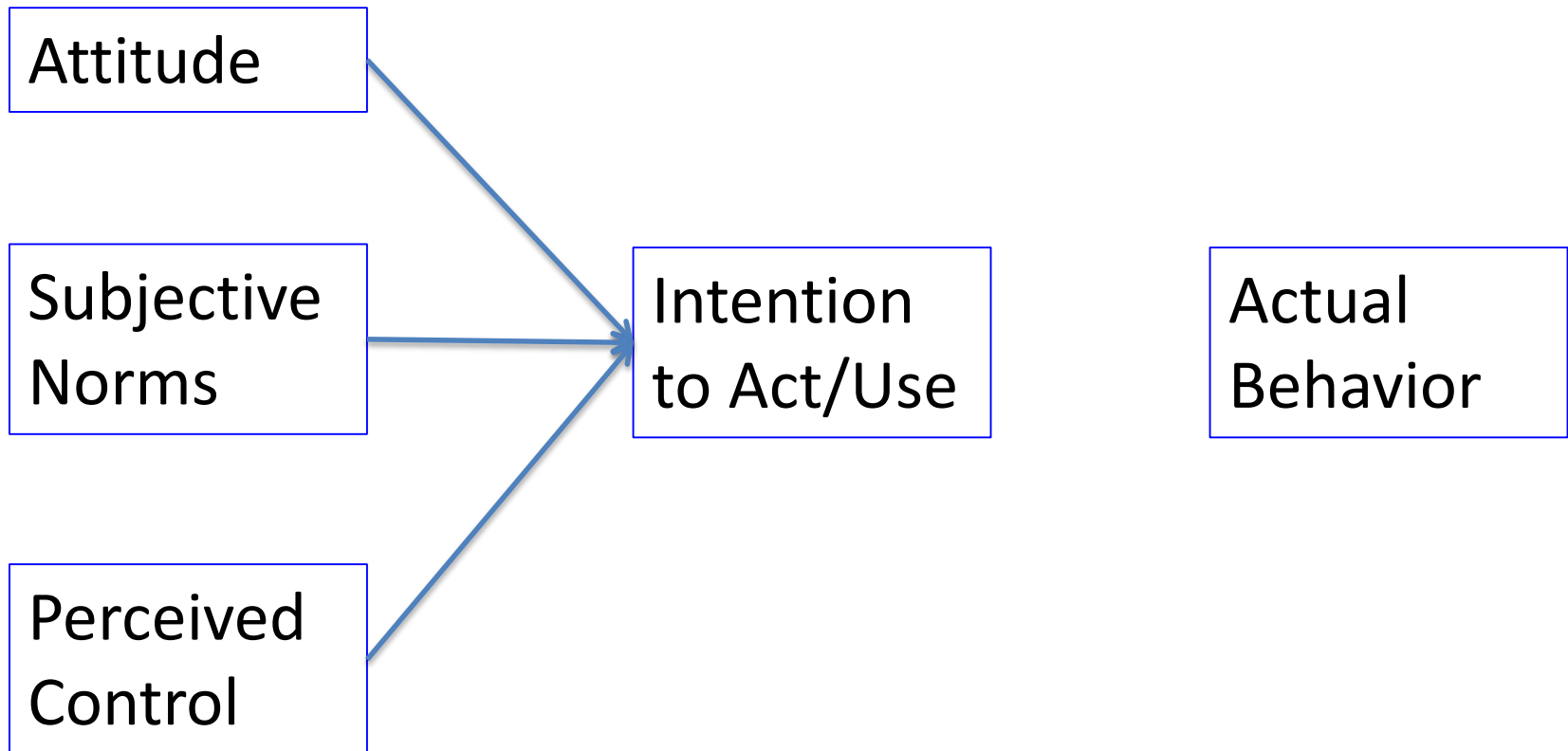
- social pressure to perform or not perform the behavior and the degree to which they care

## Perceived control

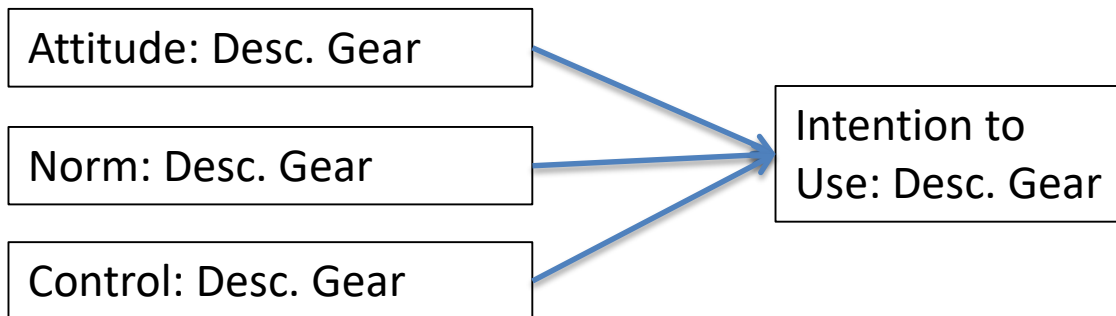
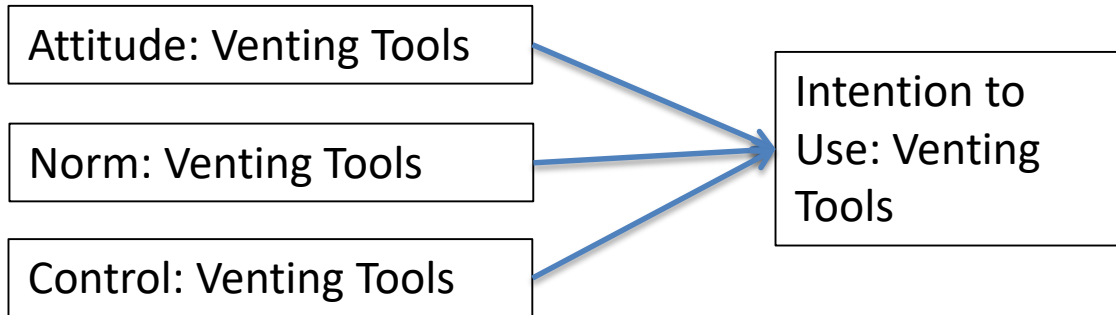
- confidence in their ability to perform the behavior



# Theory of Planned Behavior



# Survey Models



# Intention

- I intend to use () next time I experience a fish that cannot return to depth

Please indicate the level to which you agree or disagree with the following statements:

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
I intend to use a venting tool next time I experience a fish that cannot return to depth	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I intend to use fish descending gear next time I experience a fish that cannot return to depth	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



# Attitude

- Using (a venting tool/fish descending gear) will help fish return to depth
- Using () will improve survival of released fish
- Using () takes a lot of time
- () are difficult to use
- () are expensive

# Norm

- Fishers like me use ()
- Other fishers expect me to use ()
- Fisheries managers expect me to use ()
- Other fishermen support the use of ()
- Other fishermen think () can improve the survival of released fish
- I feel social pressure to use ()

# Perceived Control

- I am confident in my ability to use ()
- I do not know how to use ()
- I need more training on how to use ()
- Whether or not I use () is entirely up to me
- I expect fisheries management to provide training on how to use () properly

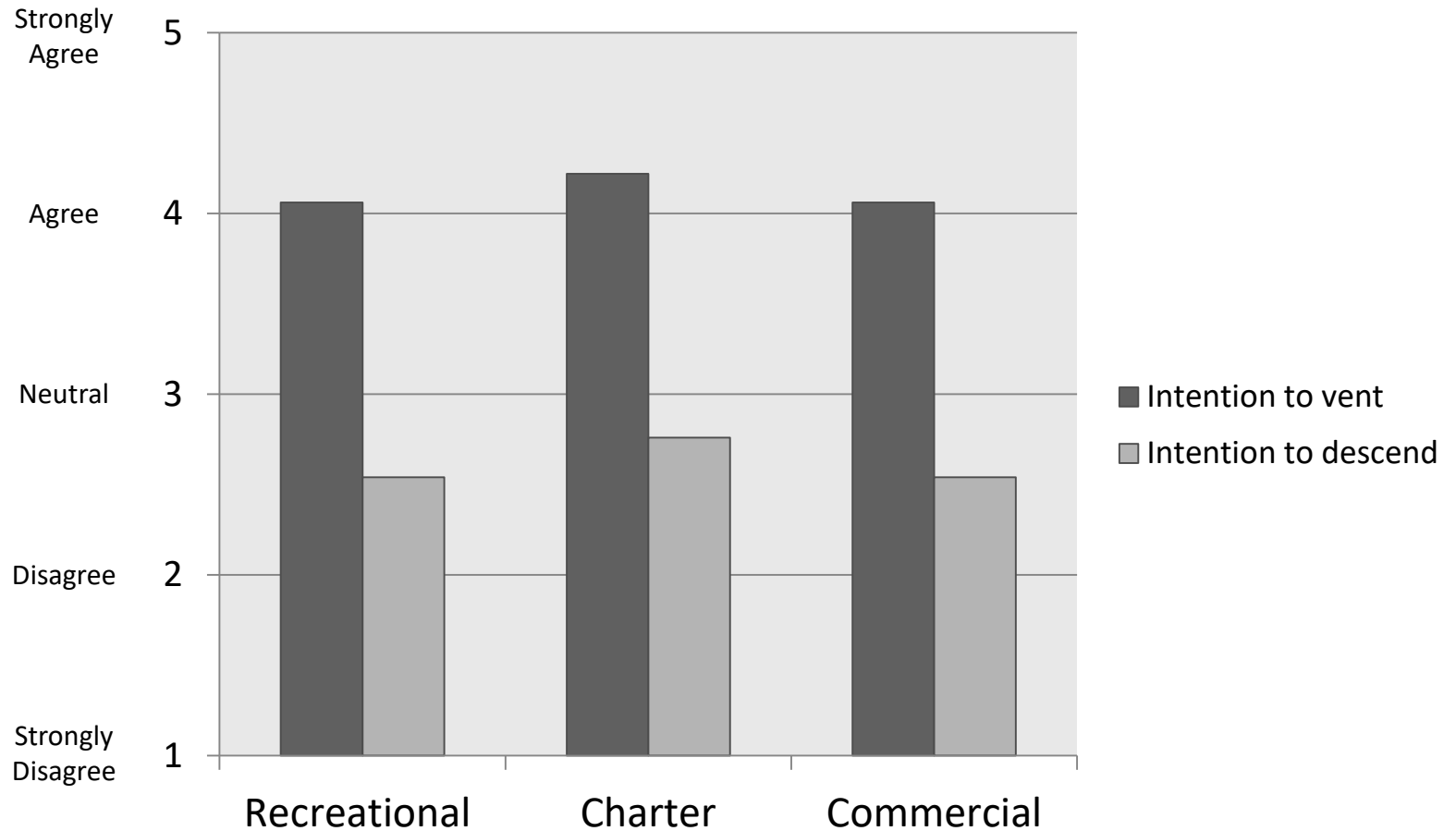


# Survey

- Online survey using the Qualtrics software
- Distributed via email in December 2015 and January 2016.
- Recreational anglers, fishing charter operators, and commercial fishers
- Survey distribution included personalized emails, and email reminders were sent one week after initial contact in accordance with Dillman et al. (2009).
- Recreational anglers: subset of anglers who had self-identified as reef fishers in a previous stakeholder survey (Garlock and Lorenzen 2017)
- Florida charter and commercial fishing license holders who had registered their emails at the time of license application

	Sample	Respondents	Response rate
Recreational anglers	2162	573	22 %
Charter operators	1245	146	12 %
Commercial fishers	3939	270	7 %

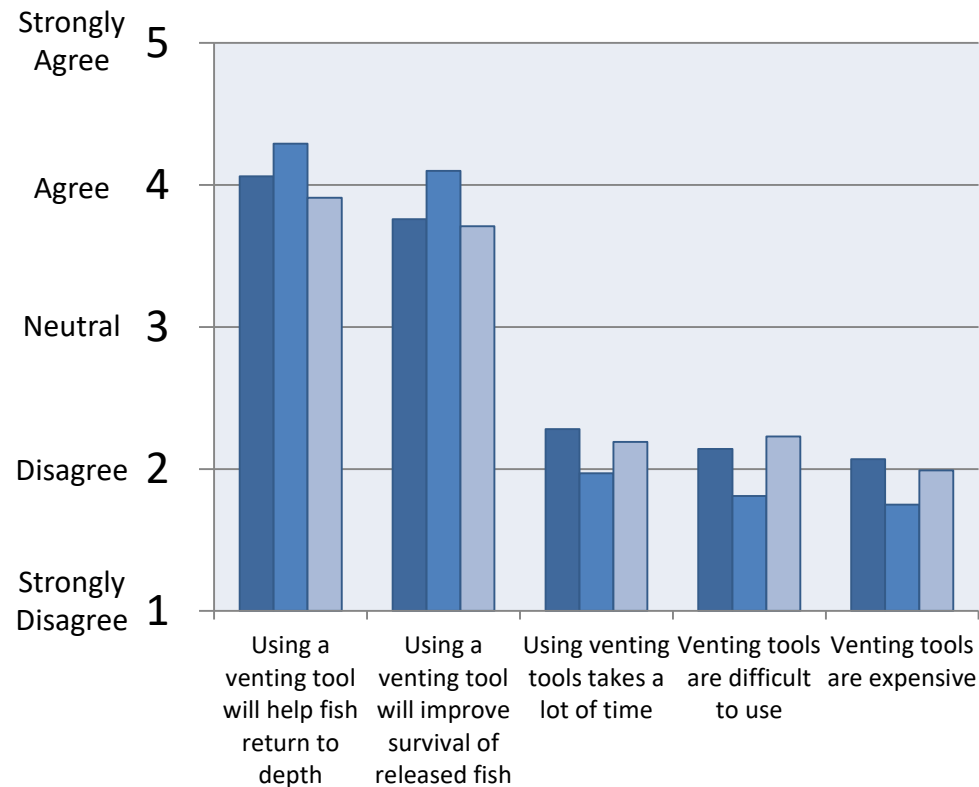
# Intention - All Respondents



# Attitudes

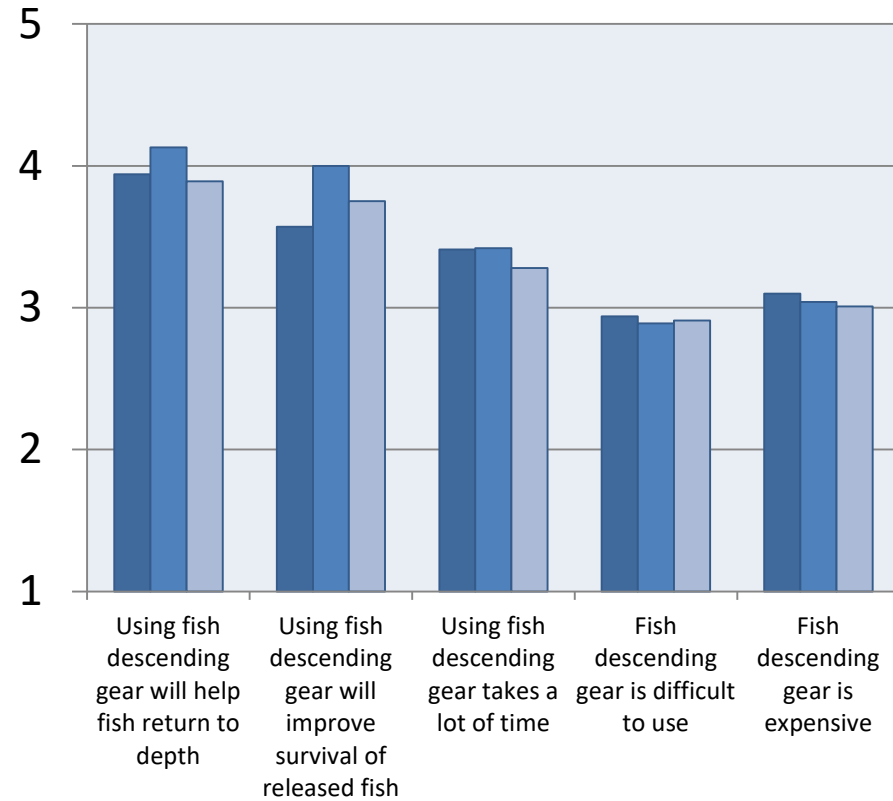
## Venting Tools

Commercial Charter Recreational



## Descending Gear

Commercial Charter Recreational

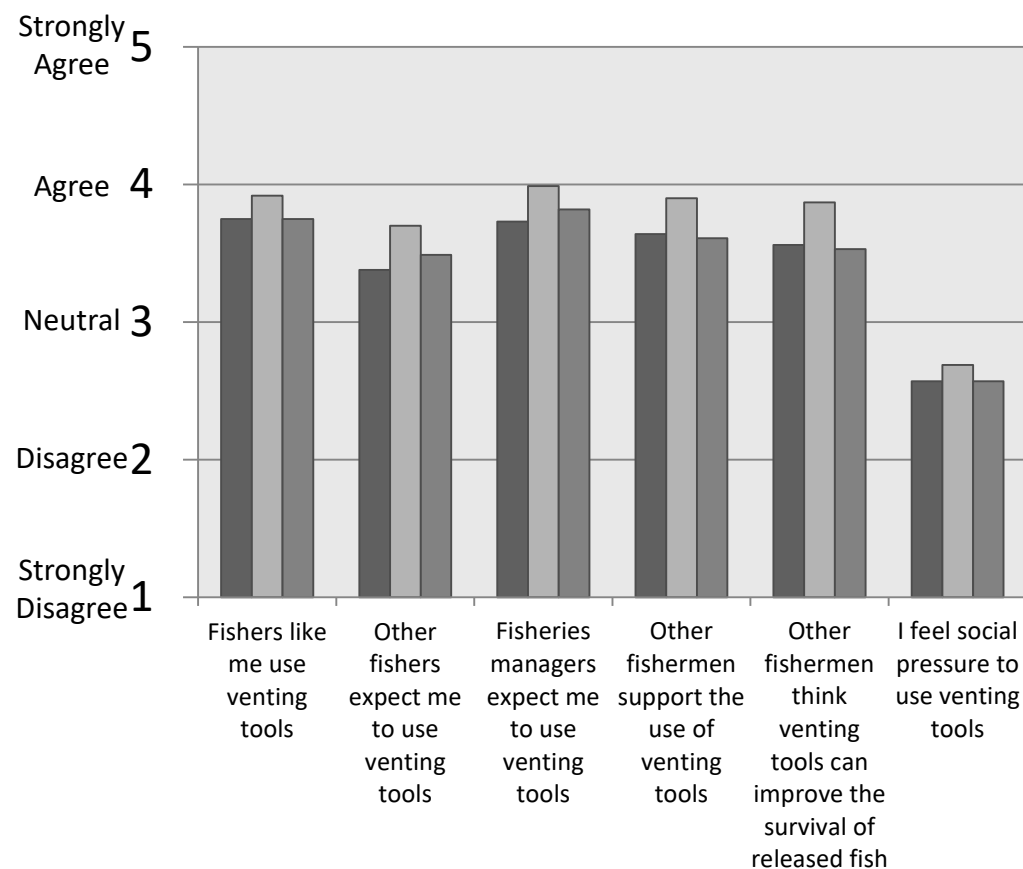




# Social Norms

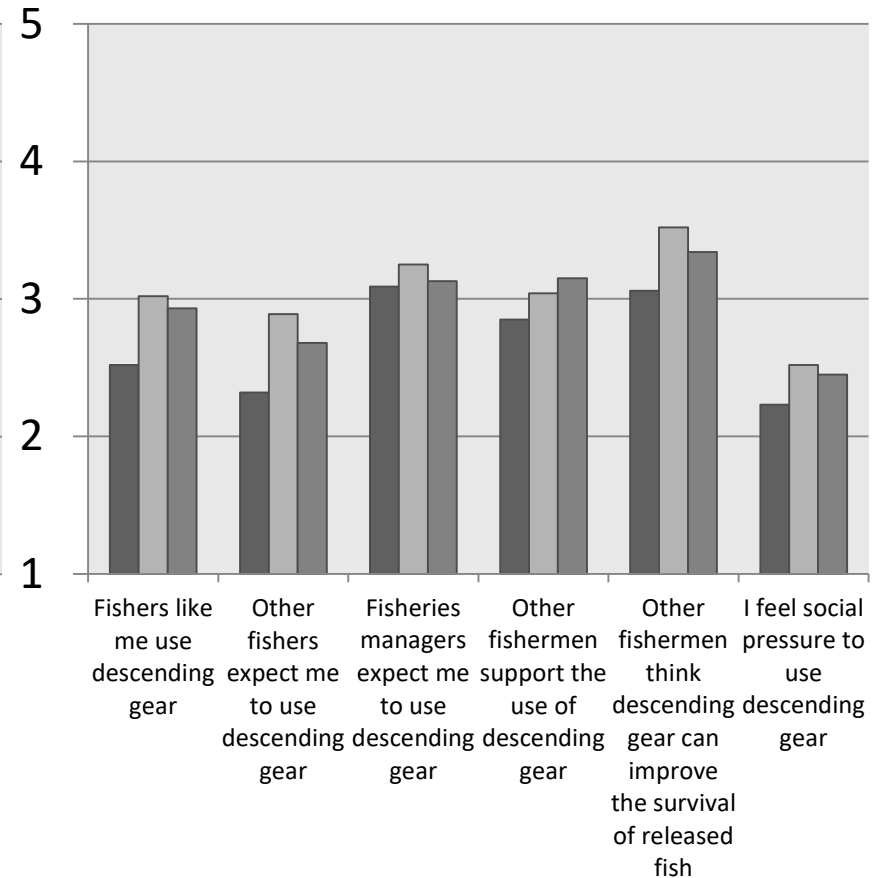
## Venting Tools

Commercial Charter Recreational



## Descending Gear

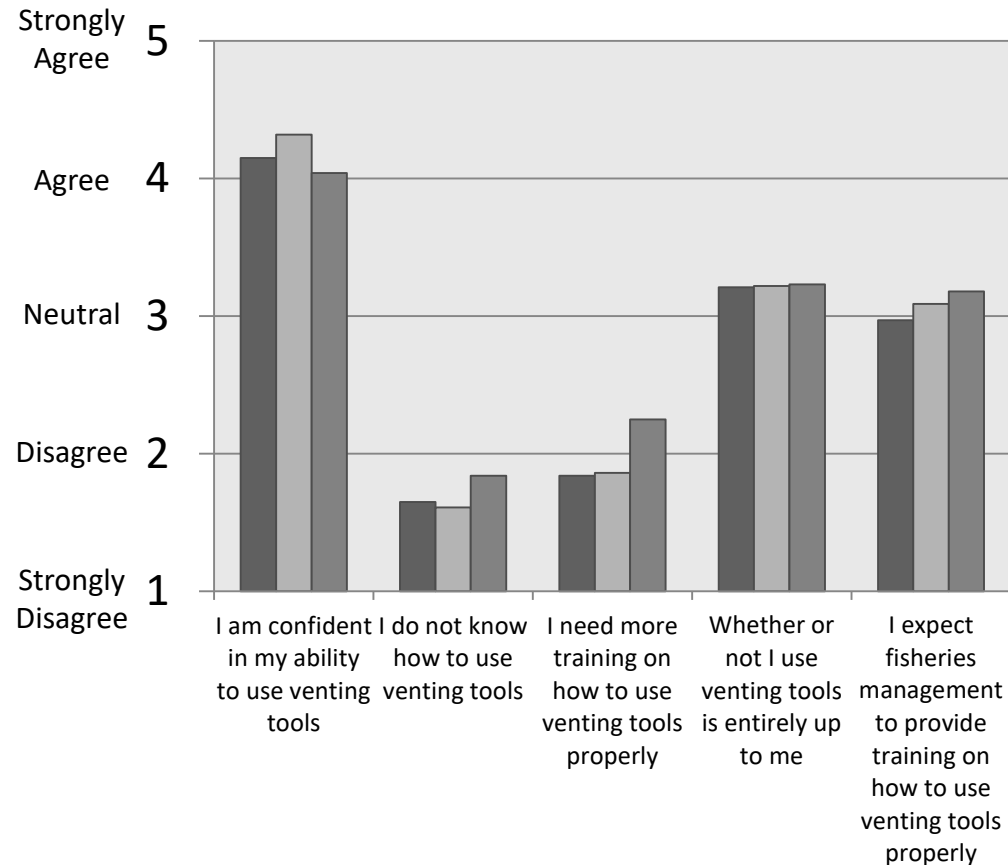
Commercial Charter Recreational



# Perceived Control

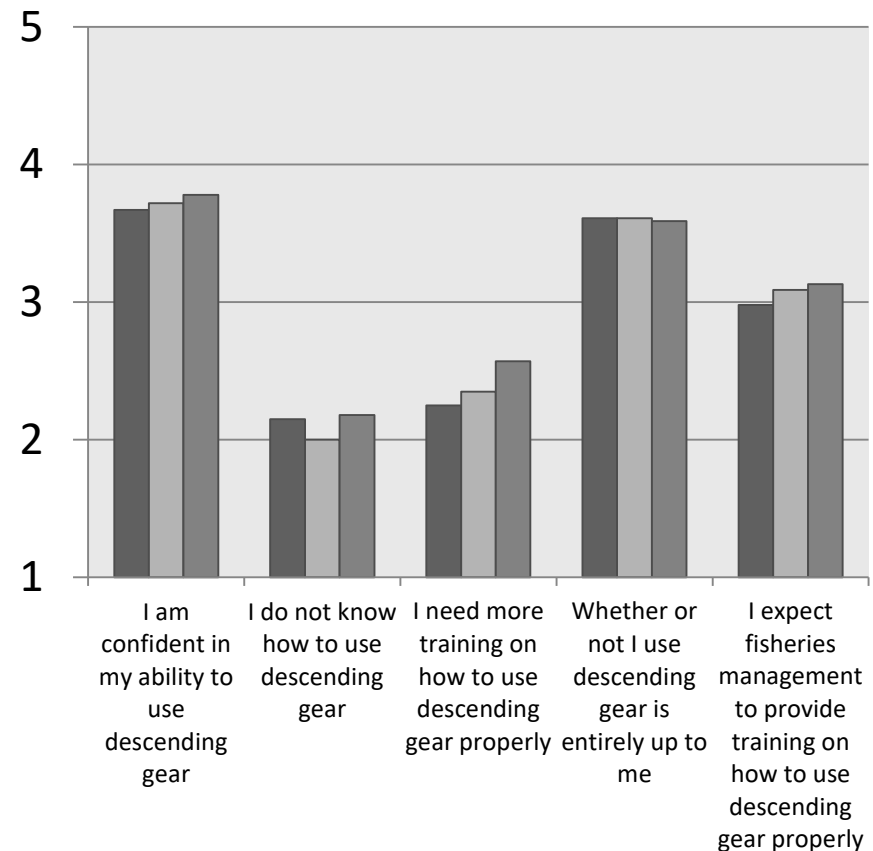
## Venting Tools

Commercial Charter Recreational



## Descending Gear

Commercial Charter Recreational



### Attitude: Venting Tools

FisherType	Beta	p
Angler	0.212	<0.001*
Charter	0.127	0.165
Commercial	0.129	0.111

### Norm: Venting Tools

Angler	0.469	<0.001*
Charter	0.497	<0.001*
Commercial	0.479	<0.001*

### Control: Venting Tools

Angler	0.082	0.022*
Charter	0.135	0.112
Commercial	0.265	<0.001*

Intention to  
Use: Venting  
Tools

### Attitude: Desc. Gear

FisherType	Beta	p
Angler	0.312	<0.001*
Charter	0.249	0.034*
Commercial	0.379	0.001*

### Norm: Desc. Gear

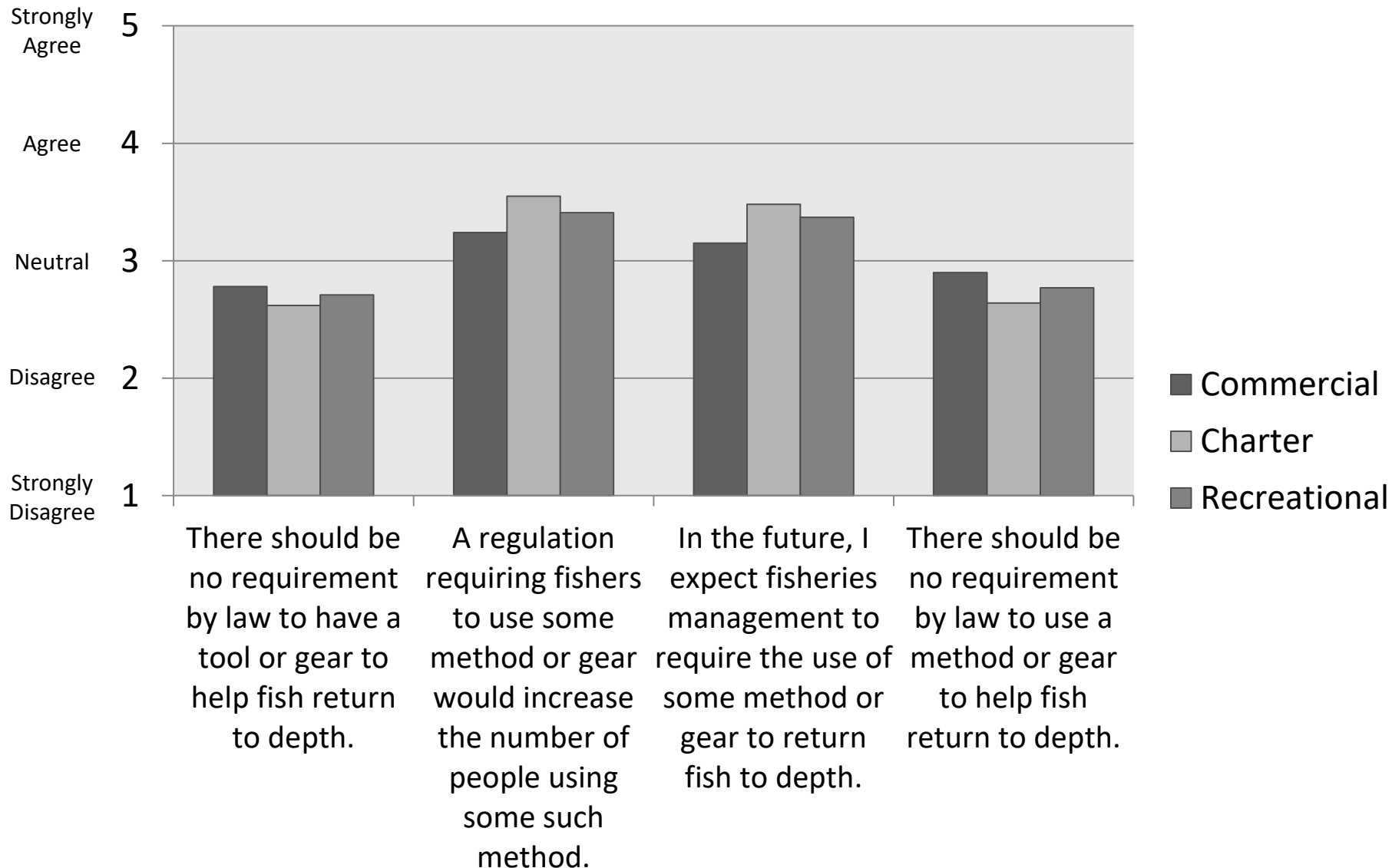
Angler	0.380	<0.001*
Charter	0.516	<0.001*
Commercial	0.448	<0.001*

### Control: Desc. Gear

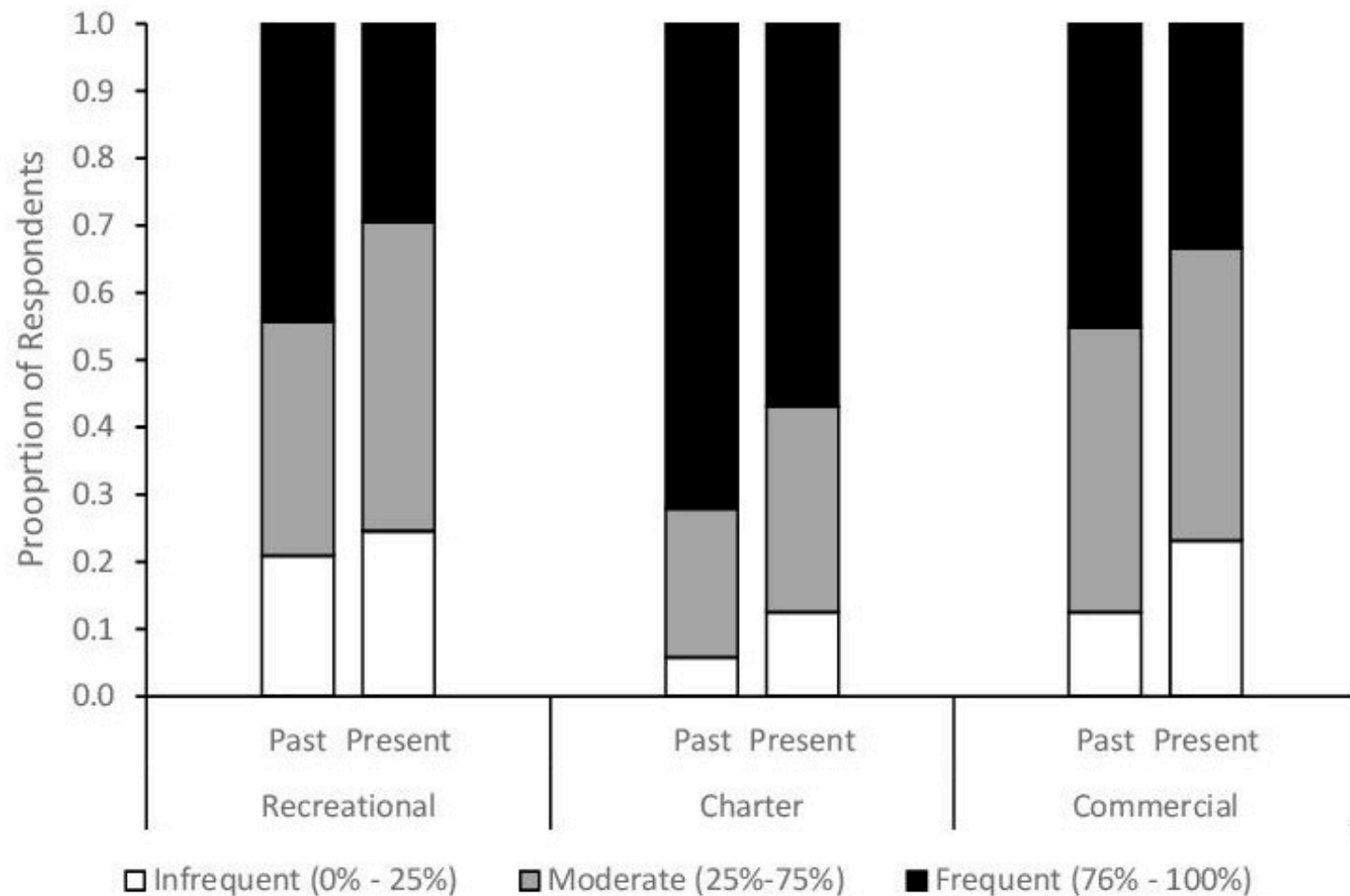
Angler	0.195	0.003*
Charter	0.184	0.059
Commercial	0.219	0.020*

Intention to  
Use: Desc. Gear

# Attitudes toward regulation



# Perceived use of barotrauma mitigation now vs. before venting tools requirement was lifted in the Gulf of Mexico



# Implications

- Emphasizing barotrauma mitigation as a **social norm** is predicted to have the greatest impact on use of mitigation measures.
- **Social norms** can be promoted through opinion leaders, fisheries forums, and regulations.
- (Re-)introduction of requirement or policy to possess/use when needed a barotrauma mitigation tool is likely to emphasize the social norm and is opposed by only a minority of fishers.



# Thank you!



Crandall, C.A.C., Garlock, T.M. & Lorenzen, K. (2018). Understanding resource-conserving behaviors among fishers: barotrauma mitigation and the power of subjective norms in Florida's reef fisheries. *North American Journal of Fisheries Management* 38: 271-280.