Values, Ideologies, and Preferences: exploring their influence on support for rights-based fisheries management

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Abstract

Values, Ideology, and Preference: exploring the influence of personal values on ideological preference for ITQs

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Individual Transferable Quota (ITQ) is an actively investigated form of fisheries management that stems from neoclassical economic theory. First implemented in the 70s in Iceland, Canada, and New Zealand this form of management, which entails a privatization of a public, common pool or open access resources, has since spread globally. A variation on ITQs exist in a majority of developed coastal states and 16% of developing states. However, despite empirical evidence that ITQs benefit the fishing sector, they remain contested on several fronts. ITQs have been connected to increases in revenue, and improved stock management. However, ITQs have also eroded communities and produced greater inequality within the fishing sector. This project explores the ideological nature of ITQ discourse and investigates if preference for ITQs management rests in part on ideologies informed by personal values, rather than being formed on the basis of empirical evidence. Findings demonstrate that there are two ideological groups within ITQ discourse and that there is a difference in personal values held by each side. Despite

the division, findings also determined points where both ideologies have near agreement on the issue. This has implication for the future design and use of ITQ programs.

List of acronyms

CDQ- Community Development Quota

ENGO- Environmental Nongovernmental Organization

FAO- Food and Agriculture Organization

IFQ- Individual Fishing Quota

IO- International Organization

IQ-Individual Quota

ITQ- Individual Transferable Quota

IVQ- Individual Vessel Quota

NGO- Nongovernmental Organization

SSF- Small Scale Fisheries

TAC- Total Allowable Catch

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Introduction

Broadly, the goals of fisheries management seek to maintain a fishery for the long-term benefit of society. This entails not only maintaining or rebuilding stock, but also ensuring fish harvest falls within sustainable bounds. Unfortunately, many of the world's fish stocks are classified as overexploited or collapsed due to ineffective management of marine resources (FAO, 2014). Through some frames this failure is a result of incomplete bounding of the social aspect of fisheries systems; management overlooks key incentives that shape fishermen behavior (Allison & Ellis, 2001; Allison et al., 2012; Ostrom, 2008, 2015; Weeratunge et al., 2014). From other perspectives the failure lies not with selecting incentives, but rather the formalization of institutions that govern fisheries. This perspective of rights-based fisheries management believes that fully functional property rights over portions of fish stock will align fishermen's incentives with the goals of fisheries management (Grafton, Arnason, Bjorndal, & Campbell, 2006; Neher, Arnason, & Mollet, 2012). Proponents for rights-based fishery management utilize the bioeconomic model to support their point, and argue for a specific type of rights-based fisheries management: individual transferable quota. This introduction will outline the predicted benefits of this shift towards rights-based management, detail the raised concerns, and explain what form rights-based management has taken in fisheries management.

The Blue Economy

The current trend within fisheries management occurs through a rights-based management perspective. These new regimes privatize area, time, catch, or another unit into a good with ownership rights. Individuals can then buy, sell, lease, or trade the good on an open market. The change represents a precursor to broader shifts in marine management, the Blue Economy.

Rather than Gunter Pauli's description of business practices to promote sustainability (Pauli, 2010), 'blue economy' here refers to economic contribution produced by marine systems. Terms such as 'risk', 'natural capital', 'value addition', 'ecosystem goods', and 'ecosystem services' are used to describe the flows between human and natural systems in marine-related fields. The results of environmental processes become marketable products to determine their contribution to a social good and to financialize their contribution to environmental sustainability.

Economic Benefits

There are different rationales that support Blue Economy investment in ocean resources. In their analysis of the Rio +20 proceedings, Silver et al. (2015) point out four interrelated strains that call for varying levels of investment in ocean resources and market-based ocean governance: oceans as natural capital, oceans as good business, oceans as integral to Pacific SIDS, and oceans as the source of SSF livelihoods (Silver, Gray, Campbell, Fairbanks, & Gruby, 2015). Oceans as natural capital discourses stressed valuing ecosystem services and utilizing those valuations to choose between ecosystem restoration or protection (Silver et al., 2015). Oceans as good business described business investment in ocean resources as the means to create sustainable and environmentally-conscious ocean governance; this viewpoint saw "human–ocean relations…structured through market relationships and incentives" (Silver et al., 2015, p. 145). Oceans as Integral to Pacific SIDS also framed its discussions through an economic lens. Ocean resources were described as "integral to their economy", and on that basis argued for partnerships in reducing illegal, unreported, and unregulated fishing as well as continued investment in marine ecosystems (Silver et al., 2015). Finally, oceans as SSF livelihoods approached discussions through the lenses of coastal economic development and poverty

reduction (Silver et al., 2015). SSF discourses argue that investment in ocean resources will lead to coastal economic development and subsequent poverty alleviation.

A briefing paper released in *the Economist* prior to the World Ocean Summit 2015 characterizes the ocean as a source for countries "to bolster slowing growth in their terrestrial economies, discover new opportunities for investment and employment, and build competitive advantage in emerging industries such as deep seabed mining and marine biotechnology" (EIU, 2015, p. 9). Furthermore, the special report characterized investment in the oceans as a "lucrative opportunity for wealth creation" (EIU, 2015, p. 15). Other reports stress a similar perspective shift in ocean governance in China and the United States (Conathan & Moore, 2015), in the Caribbean (Campbell, 2016), and in the Philippines (Teves, 2015) that places ocean resources as central to future economic growth.

Distributional Concerns

Despite the economic benefits of improved marine investment, negative parallels between the Blue Economy and terrestrial privatization can be drawn. Those opposing the fundamental reshaping of marine commons access frame the issue in terms of accumulation by dispossession. Terrestrially, the discourse engaging with the expansion of property rights and subsequent consolidation utilizes the term 'land grabbing'. The process is an expansion of Marxist primitive accumulation theory reframed as accumulation by dispossession by David Harvey (Glassman, 2006).

Within this discourse, the enclosure of common pool resources and public goods for private economic benefit leads to the concentration of capital ownership into the hands of the economically privileged and away from the already disadvantaged lower classes (Harvey, 2003, 2005, 2006). Under Harvey's theorization, privatization acts a tool of subjugation within preexisting class warfare between the elite and the proletariat through two processes. First, resources once held in trust by the state are sold to private entities. Alternatively, privatized resources are distributed to the public, but subsequent dispossession occurs from the poor through, "violent appropriation; delegitimizing claims through legislation; or most importantly, dispossession 'through the market', whereby those who have valuable assets, but are earning incomes too low to permit social reproduction, inevitably have to sell them" (Fairhead, Leach, & Scoones, 2012, p. 234).

Accumulation by dispossession has been extended to marine resources through two terms 'green grabbing' (Fairhead et al., 2012) and 'ocean grabbing' (Bennett, Govan, & Satterfield, 2015). Of the two, ocean grabbing is more generalized. It refers to "dispossession or appropriation of use, control or access to ocean space or resources from prior resource users, rights holders or inhabitants" (Bennett et al., 2015, p. 62). Green grabbing can be characterized as a special case of ocean grabbing. It occurs when resources are appropriated for reasons justified as sustainable, green, or environmentally friendly (Fairhead et al., 2012). In the marine environment examples include marine protected areas (Kelly, 2011), carbon credits (Bachram, 2004), and quota buy-back programs (Gleason et al., 2013).The expansion of property rights to the marine environment under the Blue Economy inevitably will result in the dispossession of access and use rights from marginalized groups.

Fisheries

With specific regard to fisheries, the Blue Economy is framed as a means to increase investment and improve value addition in the sector while maintaining sustainable levels of resource extraction. The FAO's *Blue Growth Initiative* integrates "key aspects of economic performance…with those of environmental performance…[to] mobilize financial and technical support and build local capacity" (Ababouch, 2015, p. 6). Suggested implementation is through 'blue carbon' funds to encourage protection of carbon-sequestering habitats or direct investment in certified sustainable stocks. Alternatively, a UNDP concept paper focuses on the spatial allocation aspect of the Blue Economy in the vein of marine spatial planning; the Blue Economy is framed as an extension of property rights where actors have rights to certain operations in specific areas, and the allocation of those rights can increase equity and optimize economic benefits (UNDP, 2015). Finally, a PEMSEA report describes the path to sustainable blue economic development as one built on a successful relationship between government and industry (Whisnat & Reyes, 2015, p. 29). Within the fisheries sector, the Blue Economy requires the creation and allocation of property rights that promote business investment.

ITQs: An extreme case

Individual transferable quota (ITQ) management systems are one aspect of this Blue Economy. ITQs are a form of limited privatization where the right to a certain portion of fish stock is allocated to actors within a fishery. They are fully liberalized; ITQs can be bought, sold, leased, and traded on an open market. However, ITQs are only effective for certain types of fish stock. In order to implement an ITQ program, a country must have the ability to effectively model a

fish species to produce a reliable TAC. Copes (1986) argued that species where escapement is targeted and the harvest is residual, species with unstable stocks where the correct TAC is not certain, and short-lived or flash fishery species do not lend themselves towards ITQ management systems. Additionally, ITQs are not well-suited for highly migratory fish species, due to differences in governance regimes in the different jurisdictions through which the fish may swim. Some countries are better able to enforce compliance within their own waters, and, in international waters, have difficulty reducing illegal, unreported, and unregulated fishing.

ITQs are a highly contested form of rights-based fisheries management because, like the Blue Economy, they fundamentally reshape the relationship between fishermen and their marine resource. The creation of quota requires the conversion of what was once a public resource, held in trust either explicitly or implicitly by the government or held in common by the people, into a private good. Within the bounds of the management program, quota functions as a quasi-property right. Quota holders are able to utilize, divide, sell, lease, or merely maintain their ownership depending upon the program (Grafton, 1996; Neher et al., 2012). Quota does not represent a right to fish, merely the ability to legally exclude others from a portion of the resource (Holm & Nielsen, 2007; Neher et al., 2012). Under this form of limited privatization, fishermen no longer have the right to fish to their capacity. Instead, they are limited to a certain portion of fish stock.

Additionally, ITQs have produced notable effects. Environmentally, net positive outcomes are undecided with some in agreement that ITQs directly produce stock recovery (Costello, Gaines, & Lynham, 2008), while others argue that observed stock recovery may be a byproduct of improved fisheries governance, not the management mechanism (Chu, 2009; Melnychuk et al.,

2012, 2014). Economic outcomes have been characterized as positive with improved market efficiency, increased resource rent, and improved income for fishermen (Abbott, Garber-Yonts, & Wilen, 2010; Arnason, 2002; Brinson & Thunberg, 2016; Reimer, Abbott, & Wilen, 2014; Scheld, Anderson, & Uchida, 2012).

Social outcomes have been framed as mostly negative. Soliman (2014b) identifies these social objections as failure to properly compensate the public in the creation of ITQs, ownership of quota by individuals indirectly active in the fishery, loss of quota from fishers within remote communities, and concentration of quota into the hands of a few actors. These objections are also held by fishermen, with the addition of the erosion of community values under quota systems, greater difficulty for newcomers to enter the fishery, and negatively perceived shifts in community power distribution (Carothers, 2015; Kokorsch, Karlsdóttir, & Benediktsson, 2015; Willson, 2013). Improved safety is often cited as a 'social' success of ITQs, however it negatively corresponds to the level of liberalization (Windle, Neis, Bornstein, Binkley, & Navarro, 2008). Economically purer forms of ITQs are less safe than their regulated counterparts.

Understanding the Debate

A helpful place to situate the ITQ debate is within the public sphere. Public sphere theory is used to describe the interaction between political actors and their ideologies. The public sphere can be rhetorical, rather than relational per Fraser (1990) and Habermas (1989). Hauser describes the rhetorical public sphere as, "a discursive space in which individuals and groups associate to discuss matters of mutual interest and, where possible, to reach a common judgment about them"

(Hauser, 1999, p. 61). A rhetorical public sphere is based upon discourses, rather than social classes; the arguments need not be rational, only norm-appropriate; and discursive interactions are bracketed rather than continuous (Hauser, 1999).

In a rhetorical public sphere, coalitions form around opinions rather than opinions resulting from a specific social group. Here it is assumed the ITQ debate is situated within a rhetorical context as proposed by Hauser. There would be two or more groups of people defined by differences in ideas rather than other variables. Ideological membership would lie independent of demographics and occur with respect to the perceived norm-appropriateness of evidence.

Ideology

Quantitative analysis requires a clear and testable definition of ideology. Here, that definition is located within the Marxist tradition. Marxist ideology theorizations permit four observations on the relationship between ideas and power (Eagleton, 1991, 1994; Thomas, 2009). First, an idea does not need to be empirically true, only perceived as true by a group of social actors to have relevancy. Second, ideas form associational relationships that correspond to coalitions composed of social actors. Third, coalitions pursue power by convincing others of the truthfulness of their idea set. Finally, an idea or belief gains subjective truthfulness through legitimization.

These observations allow us to define ideology as a set of legitimized ideas and beliefs, whether true or false, central to the reproduction of social power as a whole. Ideologies are disseminated by self-promoting social groups in conflict with one another for the purpose of gaining or maintaining power. In other words, ideologies are sets of ideas shared with others that direct

political action. An ideology within ITQ discourse would be a set of contested facts that are perceived as more truthful or agreeable by one group of people, but not another. An individual's membership to a specific group would depend upon the extent they perceive the fact as legitimate.

Personal Values

Work in cultural cognition suggests that forces guiding ideological adoption are values (Kahan & Braman, 2006; Kahan, Jenkins-Smith, & Braman, 2011). Personal values are "the criteria people use to select and justify actions and to evaluate people (including the self) and events" (Schwartz, 1992, p. 1). Cognitively, values exist prior to facts and behave as the source of legitimacy (Kahan & Braman, 2006). The extent to which an individual perceives their personal values support a fact influences its legitimacy. For example, climate change deniers justify their beliefs on value-based arguments rather than arguments based on empirical evidence (Kahan et al., 2012; McCright & Dunlap, 2011). Additionally, personal values have been connected to preference for democratic ideologies (Inglehart, 2006; Welzel & Inglehart, 2009), consumptive preferences (Steenhaut & Van Kenhove, 2006), and economic ideology (Soderbaum, 1999).

Personal values would similarly affect adoption of ITQ ideologies. Evidence regarding the theoretical basis as well as demonstrated outcomes of ITQs would be legitimized through personal values. Certain facts would only be seen as relevant if they matched an individual's values, regardless of empirical documentation. Therefore, there would be a difference in personal values between ideological groups.

Methods

A combination of survey, cluster analysis and principal component analysis was used to determine the breadth of the debate. A similar process of analysis was applied to understanding the ideological differences between neoliberal economists and ecological economists (Illge & Schwarze, 2009)

16 statements [Table 1] were identified within academic literature and reports produced by IOs and ENGOs. These statements referenced different fisheries management paradigms, goals in fisheries management, and outcomes of ITQ programs. Respondents listed their level of agreement with each statement along a 5-point Likert scale ranging from 'strongly agree' to 'strongly disagree'. Free-response questions were included to clarify what themes respondents considered as important, beyond those captured in the statements. Data was also collected regarding preference for ITQ management, age, level of education, profession, and personal values.

The survey was distributed electronically over a 5-month period through academic and management list servs per Illge & Schwarze. Respondents before and after taking the survey were asked to distribute it to, "colleagues who also work on, with, or under ITQ programs." Based upon personal correspondence with respondents, the survey was distributed beyond the initial list servs.

Table 1: Fact statements and corresponding sources

Statement		**Source**
1.	ITQs should play an integral role in the future of fisheries management	Bonzon et al. (2013)
2.	ITQs can meet the goals of fisheries management if they are clearly defined	Bonzon et al. (2013)
3.	Fishing communities are threatened by a move towards privatization in fisheries management	Carothers & Chambers (2012)
4.	The world's nearshore fisheries are being driven to the verge of collapse by overfishing	Fish Forever (2016)
5.	State managed fisheries underperform and are wasteful, costing the global economy	Willman, Kelleher, Arnason, & Franz, (2009)
6.	In the absence of private property rights fishers will compete with each other to catch more fish, ending in ruin for both the fishers and the fish	Carothers & Chambers (2012)
7.	Communities cannot manage their own fisheries well when exposed to global pressures	Pedersen et al. (2014)
8.	The wellbeing of society is improved by the wealth generated from ITQs	SIFAR (2004)
9.	The implementation of ITQs tends to lead towards biologically improved fisheries	Costello et al. (2012)
10.	A total allowable catch limits overfishing more than the division of quota into privatized shares	Melnychuk et al. (2012)
11.	The quality of community life has declined under ITQs or will decline if ITQs are introduced	Buxton et al. (2014)
12.	Payment should be made for the right to use and access a fishery	SIFAR (2004)
13.	ITQs can meet explicit social equity goals, in addition to biologic sustainability and economic efficiency goals	Mcllwain (2013)
14.	Allocating rights alienates and deprives the fishers/fishermen that would benefit most from them	Allison et al. (2012)
15.	An advantage with ITQs is larger-scale fishing operations buy out smaller-scale operations	TNC (2016)
16.	ITQs influence fishing practices allowing for the conservation of marine biodiversity	Grafton et al. (2006)

Table 2: Similarity-based positional value statements recommended by Schwartz & Bardi (2001)

How much are you like someone who…	
17.	Believes it is important to be creative, to think up new ideas
18.	Thinks laws are the best way to promote good behavior
19.	Avoids doing anything risky and prefers to live in safe surroundings
20.	Prioritizes that their actions are for the good of society
21.	Helps and cares for the people that they are with every day
22.	Strives to be successful so that others will recognize their achievements
23.	Behaves properly, trying to avoid doing anything people would say is wrong
24.	Follows the customs and traditions passed down in their family
How important is it to teach a child the values of…	
25.	Independence
26.	Hard work
27.	Responsibility
28.	Cooperation with others
29.	Imagination
30.	Tolerance of other viewpoints
31.	Thrift, saving money and resources
32.	Generosity

This study did not presuppose membership to a specific ideological group for each respondent based upon institutional affiliation. Clustering occurred with respect to statements 3 through 16. The number of clusters was determined by internal validity using the package NbClust developed by Charrad, Ghazzali, Boiteau, & Niknafs (2014) across *k*-means and HAC algorithms [Ward, Average, Median] utilizing *Minikowski* measures of distance. Final analysis used the *k*-means clustering algorithm of Hartigan & Wong (1979).

Groups were then compared with respect to preference for ITQ management, age, gender, level of education, profession, and similarity-based positional value statements recommended by Schwartz & Bardi (2001). In addition, a degree of agreement was calculated for each statement to determine the extent of disagreement between groups. Because of variability in observed opinions regarding ITQs, it was hypothesized that there would be no relationship between group

membership and age, gender, profession, and years of education. This would validate the assumption of a rhetorical public sphere. However, it was hypothesized that there would be a relationship between group membership and personal values.

Principal component analysis was used to determine relative importance of each statement to the division between ideological groups. Statements with greater loading on the first two principal components were identified as primary contributors to the division. Respondent loadings on the primary component were compared to preference, demographic variables, and personal values. Correlation between the primary component and preference would indicate that the survey statements with greatest loading could be used as a predictor for ITQ stance and determine the relationship between personal values and ideological polarization.

Free responses were used to further clarify the ideological distinction between groups. Themes were identified while reading responses. The number of times a theme was mentioned in all responses was counted, as well as the frequency a theme was mentioned by group. Frequency was assumed to indicate that specific theme's importance to the ideological group.

Results

Over the five-month period a total of 107 responses were collected representing a total of 31 programs [Figure 1]. Surprisingly, some respondents identified IQ, IVQ, and other catch share programs as ITQ.

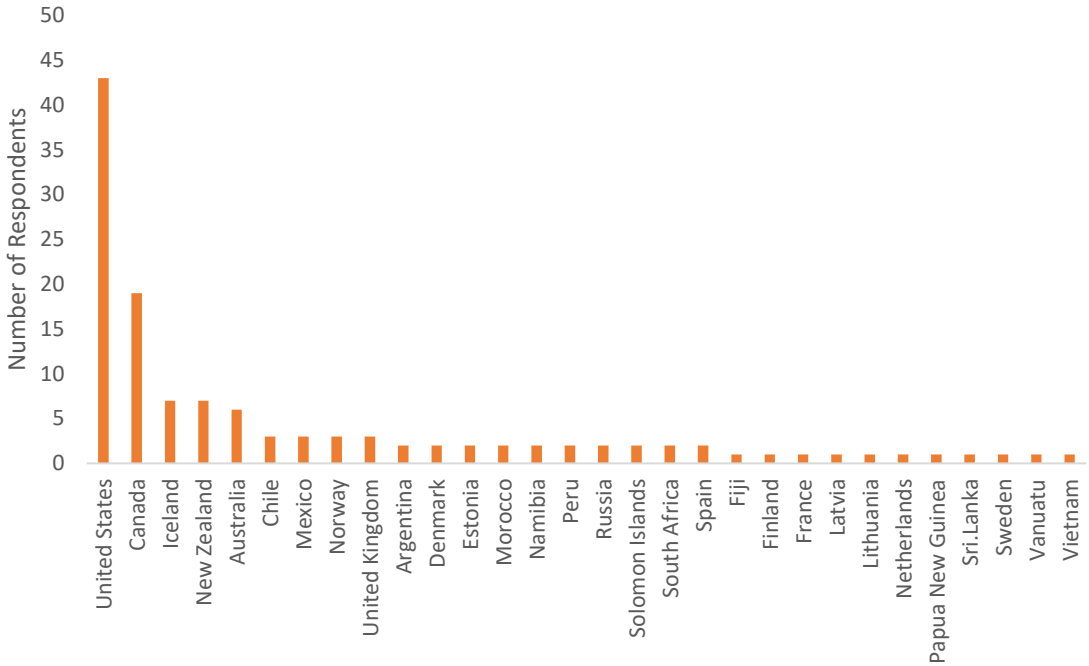

Figure 1: Number of respondents self-reporting working with ITQ programs in a given country. Brazil, Croatia, Fiji, France, Germany, India, Italy, Japan, Latvia, Lithuania, Mexico, Morocco, Namibia, Papua New Guinea, Poland, Portugal, Russia, Samoa, Solomon Islands, Spain, Sri.Lanka, United Kingdom, Vanuatu, and Vietnam are reported as having catch shares, but not ITQs. (n=107)

After data cleaning, a total of 70 respondents answered all questions fully. If these, 41% were female, 80% had reached a graduate level of education, and the average age was 49. Most respondents identified as researchers, but fishermen, representatives from various organizations, and managers were also present [Figure 2].

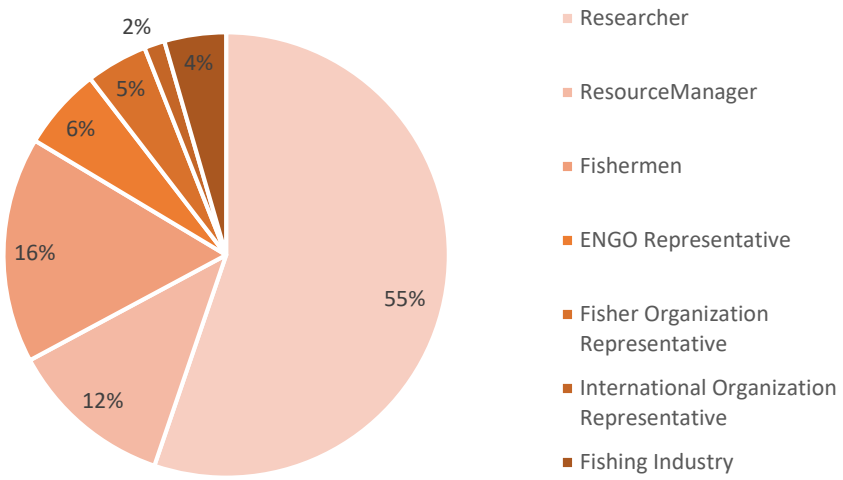

Figure 2: Self-selected primary group membership. (n=70)

Responses to statements did not exhibit bimodality. Instead, respondents exhibited central tendency bias, preferring the response of 'unsure'. However, cluster analysis was able to successfully identify groups. Across each algorithm, the best number of clusters according to the majority rule was 2.

The two groups were compared using t-tests assuming unequal variance and chi-square. There was no significant difference between age, profession, gender, and level of education. However, there was significance for five variables [Table 3]. Group 1 tended to work with fewer ITQ programs. It also disagreed with continued use of ITQs [Statement 1] and that ITQs can jointly meet social, economic, and environmental goals [Statement 2]. Finally, Group 1 valued norm-based control, rather than formally institutionalized rules [Statement 18]. Group 2 valued external control over their actions more than Group 1 [Statement 22].

Table 3: Mean value for variables identified as significantly different using a t-test assuming unequal variances between k-means groups. ($p < 0.5$ *, 0.1 **, 0.01 ***)

	Group 1	Group 2	t-stat
Programs (count)	1.11	2.14	2.30*
Statement 1	-0.81	1.00	6.80***
Statement 2	-0.26	1.23	5.38***
Statement 18	-0.11	0.40	2.16*
Statement 22	-0.19	0.56	3.12**

The 'degree of agreement' demonstrates which statements Group 1 tended to agree with more than Group 2. Each group's average level agreement with the statements was subtracted from the average response from all respondents. The statements with the least amount of difference in response between groups were 3, 5, 10, and 15 [Figure 3]. The groups agree that communities are threatened by a move towards privatization in fisheries management [Statement 3] and that the buyout of smaller-scale operations by larger operations is a disadvantage [Statement 15]; the difference is that Group 1 agrees more than Group 2. Additionally, other points of agreement include that TACs limit fishing more so than ITQs [Statement 10] and that State managed fisheries are not wasteful [Statement 5]. Again, the difference lies in the extent to which group agrees with each statement, with Group 1 agreeing more than Group 2.

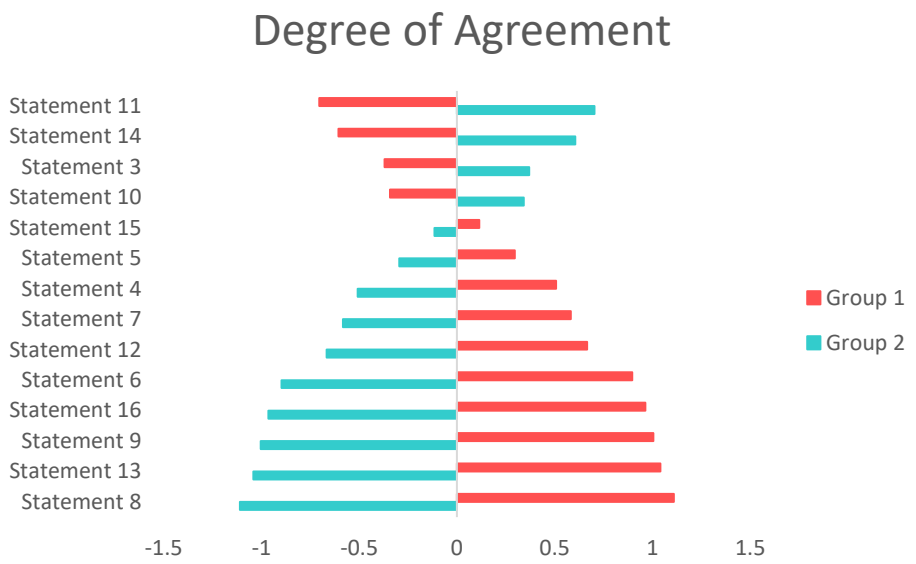

Figure 3: Degree of agreement for statements 3-16 for Group 1 (n=27) and Group 2 (n=43). Groups agree that communities are threatened by a move towards privatization in fisheries management, the buyout of smaller-scale operations by larger operations is a disadvantage, TACs limit fishing more so than ITQs, and that State managed fisheries are not wasteful.

Principal component analysis was utilized to determine which statements contributed the most towards the group division [Table 4]. Component 1 explained 37.78% of the variance within the data. Component 2 explained 10.96% of the variance. Through all components, statements that corresponded most to PC1 were 6, 8, 9, 13 and 16. However, statements 8, 9, and 13 corresponded solely to PC1. Statements that corresponded most to PC2 were 3, 4, 11, and 15. However, statements 3 and 11 corresponded solely to PC2.

Table 4: Loadings of principal components explaining 80% of variance. Statements 8, 9, and 13 corresponded solely to Principal Component 1. Statements 3 and 11 corresponded solely to Principal component 2.

	PC1	PC2
Statement 3	0.19	0.56
Statement 4	0.19	0.46
Statement 5	0.15	0.23
Statement 6	0.32	0.08
Statement 7	0.27	0.17
Statement 8	0.36	0.09
Statement 9	0.34	0.21
Statement 10	0.18	0.11
Statement 11	0.27	0.33
Statement 12	0.27	0.06
Statement 13	0.30	0.02
Statement 14	0.28	0.27
Statement 15	0.11	0.36
Statement 16	0.35	0.06

Respondents were graphed according to the first two principal components for visualization in two-dimensional space [Figure 4]. The visual distinction between Group 1 and Group 2 respondents was greatest for PC1. With respect to component loading, the primary divisive opinions were that wealth generated by ITQs does not improve communities socially, ITQs do not directly improve fisheries biologically, and that ITQs can meet social goals.

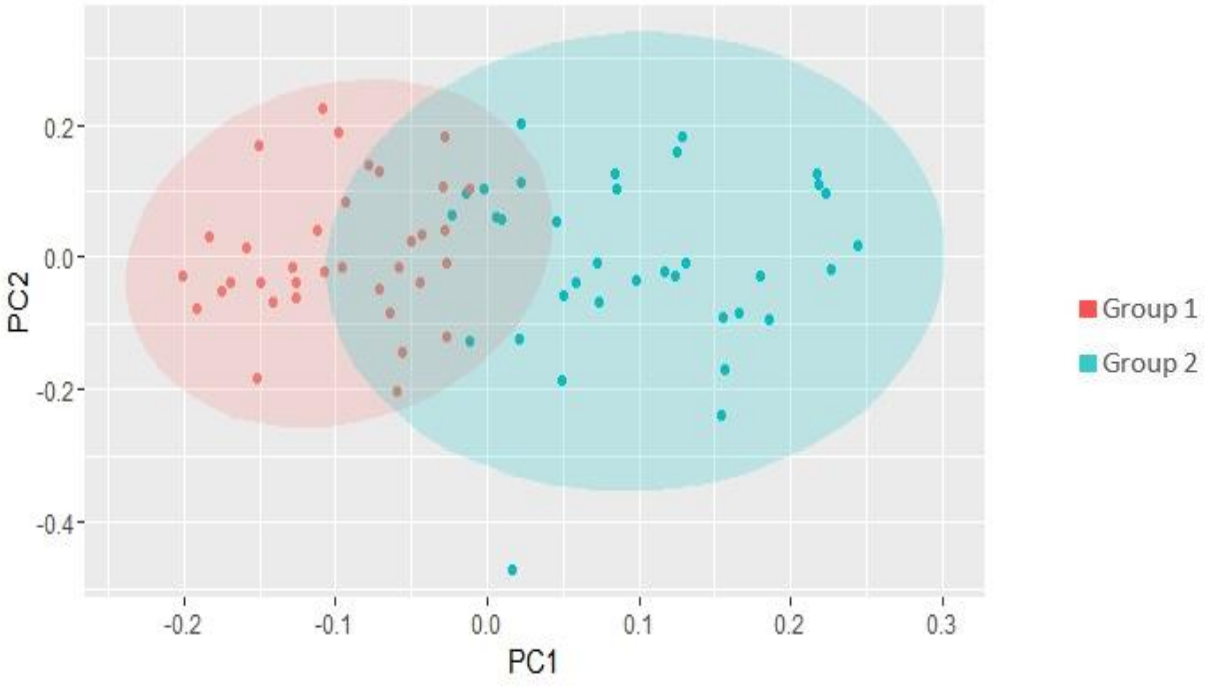

Figure 4: *k*-means cluster analysis spread for Group 1 (n= 27) and Group 2 (n= 43) with respect to PC1 (wealth generated by ITQs does not improve communities socially, ITQs do not directly improve fisheries biologically, and that ITQs currently meet social goals) and PC2 (communities are threatened by privatization and community life has declined under ITQs).

PC1 was regressed on responses to statements 1, 2, age, and education. It negatively correlated to responses for statement 1 (r^2= 0.54, S.E.=0.92, n=70) and statement 2 (r^2=0.42, S.E.=0.95, n=70). There was no correlation between age (r^2= 0.004, S.E.=17, n=64), education (r^2= 0.037, S.E.=1.97, n=64). A one-way ANOVA was conducted to determine the effect of profession on PC1. There was not a significant relationship [F (10, 638) = 0.26, p= 0.98]. PC1 did have a relationship with stance towards ITQs, but did not with measured demographics.

Some respondents did choose to answer the free response questions. There was an average of 57 responses, with the question asking about threats to fisheries receiving the most responses. Key

benefits identified [Table 6] were the stability and wealth created by ITQs, a removal of the 'race to fish', and better data produced when fisheries are managed under quota regimes. Problems centered on variations of consolidation and armchair fishing, the difficulty of entering the fishing fleet or fishermen being priced out of the industry, and the equity of initial allocation mechanisms.

Table 5: Number of time theme was mentioned by respondents as a benefit or a problem related to ITQs.

	Benefit	Problem
Allocation	1	13
Property Rights	--	5
Consolidation/ Armchair	--	24
Entry & Fleet Greying	--	16
Safety	7	--
Wealth Generation, Price Increases	29	--
Community Values	3	8
Stock Recovery/ Bycatch reduction	5	3
Race to fish & Stewardship	33	3
Innovation	2	5
Data and Quality of Management	9	9
Small Scale Fisheries	--	7

Interestingly, few themes were shared as threats to fisheries and as a concern for resource managers [Table 6]. Of those, selecting appropriate incentives shaping fishermen behavior, the capacity for scientific prediction of stock size, and equity were stressed by respondents. Recommendations for the future of fish stock management centered on an ecosystem-approach, though some respondents felt that the capacity for such an approach does not exist yet. It was also interesting to find that a focus on wealth creation was identified as a threat to fisheries, even though wealth generation was identified as one of the main benefits of ITQ programs.

Table 6: Number of times theme was mentioned by respondents either as a threat to fisheries or as a concern for fishery managers.

	Threat	Concern
Too few fish	2	--
Too many fishers	14	--
Too much demand	7	--
Lack of enforced management	16	--
Pollution/Habitat Destruction	9	--
Range Shifts	2	2
Climate Change/ Ocean Acidification	10	--
Privatization	8	3
Lack of Property Rights	3	--
Focus on wealth creation	10	1
Appropriate Incentives	1	8
ENGOs	4	--
Current Scientific Ability	6	17
Politics/ Equity	3	9
Future Stocks	--	16
Clear Goals	--	16
Community Persistence	--	13

Discussion

Characterization of respondents suggest that they were primarily mid-career academics who have worked on issues related to quota management systems. The distribution of opinions captured within the data primarily belong to academics. The results suggest that academics' perception of relevant and acceptable knowledge in the field of fishery sciences depends on which ideological group they belong to, not rational evaluation of study results. Even understanding of ITQs was distributed unequally. Some respondents believed that individual vessel quota systems, individual quota systems, and territorial use rights for fisheries were ITQs. However, like ITQs, they are other forms of fisheries privatization. Within an expert population, one form of fisheries management has been conflated with a broader typology. Perhaps the presence of two ideological groups is unsurprising due to this confusion over the nature of the programs.

Ideologies

The analysis identified two opinion groups among researchers regarding ITQ management with respect to statements 3 through 16 independent of demographic variables. ITQ discourse occurs in a rhetorical public sphere. Political action occurs around identification with specific ideologies rather than other demographic factors. Since ideologies are only composed of contested ideas instead of those agreed upon to varying extents, the ideologies here take form with fewer than the full list of statements [Table 7]. Disagreement between the two groups occurred along several points. However, principal component analysis identified the driving opinions behind the division as: belief ITQs can meet social equity goals, support for the narrative of collapse, belief that wealth improves societal wellbeing, and that ITQs lead to biologically improved stocks.

Table 7: Characterization of Group 1 and Group 2 ideologies based upon survey results, emphasis placed on statements identified as primary contributors to the divide.

	Group 1	Group 2
ITQs can meet social equity goals	**-**	**+**
Property rights prevent the race to fish	**-**	**+**
Wealth improves societal wellbeing	**-**	**+**
Stocks are improved by ITQs	**-**	**+**
ITQs degrade community life	+	-
You should pay to fish	-	+
Overfishing causes nearshore stock collapse	-	+
Rights allocation alienates fishermen	+	-

Ideological groups were able to agree on four points, but the extent of agreement varied between the two [Table 8]. Group 1 believed more than Group 2 that fisheries privatization threatens fishing communities, that buy out of smaller vessels is undesirable, that TAC is more effective at limiting overfishing, and that state managed fisheries are not wasteful.

Table 8: Points of agreement between Group 1 and Group2.

	Group 1	Group 2
Communities are threatened by privatization	++	+
Buy out of small scale fishermen is undesirable	++	+
TACs limit overfishing more than ITQs	++	+
State managed fisheries are wasteful	--	-

Group 1

Group 1 ideology focuses strongly on the social effect ITQ programs have on fishing communities, and perceives those effects as negative. Additionally, many of the issues with ITQs are tied directly to the existence of property rights for this group. In other words, Group 1 believes property rights will lead to consolidation, armchair fishing, and community degradation regardless of regulatory controls integrated into management policy. Based upon the ideology characterization, this respondent was selected as Group 1 and captures their group opinion effectively:

> In BC, coastal communities (including First Nations) are being hit hard by loss of access to the industry that had previously sustained them. Meanwhile, corporate entities and other deep pockets are buying up quota and consolidating the industry into fewer hands. We've seen fishermen turned into sharecroppers on their own boats through predatory leasing policies from corporate quota holders. The resulting loss of revenue to coastal communities has been devastating. On the environmental front, I'm not convinced ITQs are great either. Who is more likely to fish using ecologically sound methods and take a long-term view of the environmental effects of their actions - a third generation fisherman who fishes

> where he lives, or a corporate fleet that rolls through once a season to scoop up their quota at maximum efficiency and make their quarterly profits?

Group 2

Group 2 ideology focuses on what ITQs do well, decreasing the 'race-to-fish', increasing fishermen incomes, and improving economic efficiency. In this group, fishing is viewed primarily as a source of income, and that income leads to positive fishermen wellbeing. Social issues that result from privatization such as entry barriers to new fishermen, loss of quota from communities, and consolidation, can be met by refining management regulations. The following response best captures the opinion of Group 2:

> [ITQs] improve the economic value of the fishery by allowing fishers to schedule their fishing operations to get most value for the fish caught, rather than rushing to catch as much as possible before the competing fishers catch the quota. There are many examples of this, including the eastern Canada cod fishery, where people were surprised that fishing vessels didn't decline in number of days fished after getting quotas. But a bit of research showed that each vessel slowed down, allowing the processing plant operation to take control, rather than the deck boss -- - reducing the speed with which fish were delivered below deck and allowing much more efficient processing. This resulted in an increase in volume and value of fish products, but now decrease in fishing effort.

The presence of ideological groups does not necessarily undermine unbiased science. Disciplines should have a variety of opinions and research interests that allow them to fully investigate

observed phenomena. However, the issue here is that ideological membership directly correlates to political stance towards ITQs. Individuals that belong to a Group 1 mindset do not support ITQ programs, independent of evidence or other demographic factors. This observation holds true for Group 2. Research and ideas have become charged with political purpose rather than investigative interest. The production and interpretation of knowledge for both groups is for the purpose of political conversion, and depends on their subjective personal values rather than objective standards.

Personal Values

The connection between personal values, ideology, and preference for ITQs occurs with respect to two key values. Group 1 and Group 2 had significantly different responses to statements 18 and 22. Statement 18 corresponded to the formalization of governing institutions. Group 1 preferred that control be placed with norms, rather than formally institutionalized rules. Statement 22 corresponded to the placement of control, with Group 2 valuing external control over their actions more than Group 1. This means that Group 1 values informal institutions that permit self-direction and creativity. Group 2, on the other hand, preferences formal institutions that provide external guidance over their actions.

This result mirrors previous findings that connect personal values to ideological preference. Kahan & Braman (2006) report that worldview and personal values align along two axes: hierarchist/egalitarian and individualist/communitarian. Inglehart, Basanez, & Moreno (1998) and Welzel & Inglehart (2009) use similar axial divisions. Schwartz (1992) divides values along social/personal focus, external/internal focus, and for/against change. It makes sense then that

Group 1 would not support ITQs when evaluating the programs with respect to personal values, even though Group 2 would. ITQs necessitate centralized command-and-control governance (Holm & Nielsen, 2007; Neher et al., 2012), a style of governance that aligns more with the hierarchist and individualist values of Group 2. The importance of personal values suggests that the policy debate over ITQs is unresolvable, even if all fisheries were converted to the management regime.

Value divisions align with the multiple forms of commons management. Commons can be managed for egalitarian and communitarian purposes, or utilizing hierarchical and individualist structure (Gardner, Ostrom, & Walker, 1990; Ostrom, 1999). Other combinations of personal value preferences are also possible. Fisheries governance could occur with respect to a community's value preferences and perhaps increase the acceptance of management. ITQs could be used in circumstances where formal command-and-control management best matches community values, and alternative forms of governance could be used in other situations. Value alignment in this manner would only address issues with community acceptance of the programs. Broader discursive discussions would still occur between individuals not directly affected by the fisheries governance, yet acting as political proponents for a specific ideology. It is up to a resource manager to determine the alignment between a management mechanism and a community's values.

Conclusion

The ideological divide in ITQ discourse is complex, spanning multiple disciplines. Proponents believe that ITQs should continue to be utilized due to the resource rent generated from quota

improving community wellbeing and increased biological sustainability of fish stocks. On the other hand, opponents point towards social costs, such as higher entry cost or degradation of community values, and believe that privatization at the individual level is the source of these problems. Preference for the programs occurs when ideology and personal values, not scientific rationality, supports the programs. The issue is that ideology-based preference means the divide may not be surmountable. Differing forms of legitimacy, personal value based or otherwise, are influencing political support of ITQ programs among academics.

The implications for the future of fisheries management are complex, but the findings suggest that division along value-driven ideologies will continue with broader shifts in marine management. Privatization regimes only align with one combination of personal values. This does not mean privatization within the marine commons is inherently wrong, only that the values and world views implicit in privatization regimes are not shared universally. Therefore, the privatization mandate inherent to the Blue Economy also meets one set of personal values, and in some places will be culturally unsupported. The future success of fisheries management, and marine commons governance, in part depends on how well the management regime aligns with the values of those governed.

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