

Understanding Constraints and Facilitators to Salmon Angling Participation: Insights From Structural Equation Modeling

Stian Stensland, Øystein Aas, and Mehmet Mehmetoglu

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Understanding Constraints and Facilitators to Salmon Angling Participation: Insights From Structural Equation Modeling

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ABSTRACT

Atlantic salmon sport fisheries have declined remarkably in many countries and participation seems to correlate with salmon abundance. We investigated angling participation in the Atlantic salmon sport fishery in Norwegian rivers by incorporating facilitators for participation in a constraint–negotiation model. We conducted an Internet survey of Norwegian anglers yielding 3,635 responses (40% response rate). The structural model confirmed our hypotheses and supported the conceptual constraints–effects–mitigation model of leisure constraint negotiation. Of the constraints and facilitators investigated, the structural constraints and facilitators subcategory “quality of fishing” exerted the largest influence on angling participation. The influence of constraints and facilitators was mitigated by use of corresponding negotiation strategies where “skills, knowledge, and money,” and different substitution strategies were important. To increase participation, we suggest increasing salmon abundance, offering longer fishing stretches per angler, and providing better information about where to book salmon angling.

KEYWORDS

Constraint negotiation; facilitators; fishing tourism; motivations; structural equation modeling

Q1

Introduction

Participation in outdoor recreation activities is determined by a range of macro and micro level factors (Walker & Virden, 2005). Consumptive recreation activities, such as hunting (Massei et al., 2015) and fishing (Arlinghaus, Tillner, & Bork, 2015), are generally declining in western industrialized countries. Recreational fishing (i.e., angling) is particularly interesting because it has high participation rates and is seen as a gateway activity to other forms of nature-based activities (Cordell, 2012). Macro-level trends of urbanization, aging citizens, and postmodernization can decrease fishing participation (Arlinghaus et al., 2015), and a further decline in fishing participation is expected in many western countries in the coming years. Future population growth is expected to outweigh the drop in participation rates so the overall numbers of anglers and hunters might still grow in some regions (Cordell, 2012).

For a specialized fishery such as river angling for Atlantic salmon, the number of anglers has changed more than other types of fishing. In England and Wales, the fishing effort (number of rod days) has halved between 1994 (300,000) and 2014 (145,000) (Environment Agency, 2015). The total declared salmon caught by rod in 2014 (10,307) decreased by 47%

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compared to the 5 year mean (19,353). In Newfoundland and Labrador of Canada, salmon license sales declined from 25,553 in 1996 to a low of 14,08 in 2007, before climbing to 20,000 in 2010. Dempson, Robertson, Cochrane, O'Connell, and Porter (2012) argued this spike could be a result of increasing salmon abundance from 2007 to 2010. In Norway, the number of anglers paying the mandatory salmon fishing fee dropped from 81,000 in 2006/07 to a modern-time low of 65,000 in 2014 (Stensland, Fossgard, Andersen, & Aas, 2015). The drop of 13% from 2012 to 2013 was especially profound, and the number of anglers dropped with another 3% in 2014. The drop in angler numbers of 2012–2014 shows a similar trend as catches in the rivers. The figures from Canada, the United Kingdom, and Norway indicate the resource status (stock status, size of returning stock) and related harvest regulations (season length, number of open/closed rivers, quotas, tackle restrictions) influence angler participation. Dabrowska, Haider, and Hunt (2014) showed that in British Columbia Canada, the quality of the resource, expressed by stocking effort and accessibility of fishing lakes, influenced license sales. Introducing stricter quotas in recreational fisheries has in some cases been shown to reduce participation even if it leads to increased fish abundance (e.g., in some salmon fisheries in the United Kingdom) (Aprahamian, Hickley, Shields, & Mawle, 2010).

Researchers have called for examining different populations and different activities to investigate the generalizability of constraint negotiation processes identified in previous leisure participation studies (Hubbard & Mannell, 2001; White, 2008). We address salmon fishing in Norway as a response to this issue. By doing so we use similar constructs and statistical analysis (confirmatory factor analysis and structural equation modeling) as White (2008), who looked at participation in general outdoor recreation activities and visitation to Arizona state parks. However, we expand this model and test it empirically by adding the concept of facilitators from Raymore's (2002) ecological approach to understand the influence on participation, operationalized as being one end of a constraint–facilitator continuum (Kuehn, Luzadis, & Brincka, 2013). Our measurement model with the hypothesized structural model paths is shown in Figure 1.

By testing the expanded model in a new setting, we aim specifically to look at how resource changes influence the negotiation process and participation. New insights into which factors constrain or facilitate participation, and which negotiation strategies anglers use to overcome them, provides managers and tourism stakeholders with information on how to increase participation and maximize benefits to anglers and local economies.

Constraints, facilitators, negotiation, and motivations

Studies of constraint negotiation have improved understanding of the behavioral and social–psychological processes fundamental to leisure, tourism, and outdoor recreation (Jackson, 2005; Raymore, 2002; White, 2008). Jackson (2005) recommended empirical tests of theoretically derived constraint negotiation models by using confirmatory factor analysis and structural equation modeling, and considered this an innovative and fruitful direction for further research. Loucks-Atkinson and Mannell (2007), and White (2008), used this approach and found relationships between motivations, constraints, negotiation, negotiation-efficacy, and participation in accordance with theoretical models.

Crawford and Godbey (1987) divided constraints into three types. Intrapersonal constraints are the individual's own perceptions (e.g., about level of fishing skills, health issues/physical mobility) that affect the formation of leisure preferences. Interpersonal constraints

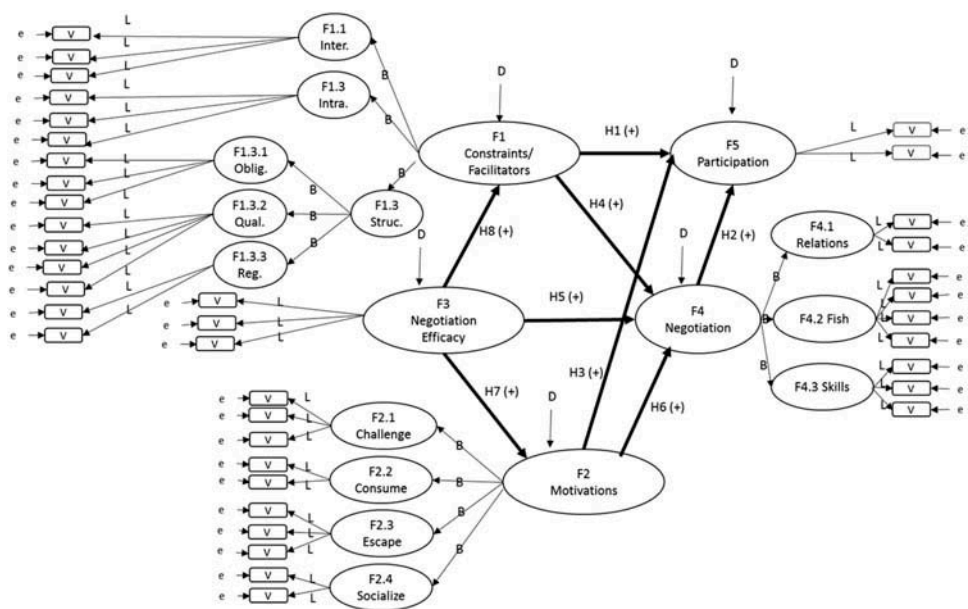


Figure 1. Measurement model of fishing constraints/facilitators negotiation with hypothesized structural model paths and parameters to be estimated. See Table 1 for variables.

involve other people (e.g., their opinion about appropriateness of fishing, having someone to go fishing with). Structural constraints occur after preferences are formed, but before actual participation takes place (e.g., lack of time, obligations, quality of fishing, regulations). Walker and Virden (2005) suggested other forms of structural constraints not yet investigated and called for research specifically to address these constraints. They proposed four sub-categories of structural constraints: natural environment structural constraints (e.g., natural features, resource conditions), social environment structural constraints (e.g., obligations to others), territorial structural constraints (e.g., access), and institutional structural constraints (e.g., regulations).

There are also factors that facilitate activity. Raymore (2002) adapted Jackson’s (1997) definition of constraints, and referred to facilitators as “factors perceived or experienced by individuals to enable or promote the formation of leisure preferences and to encourage or enhance participation” (p. 39). Kuehn et al. (2013), in a study of angling participation, operationalized the concept of constraints (negative) and facilitators (positive) as opposites on the same scale, with the three categories intrapersonal, interpersonal, and structural. Based on this literature and a similar operationalization of the concept of constraints/facilitators as Kuehn et al. (2015), our first hypothesis was:

H1: Constraints/facilitators have a direct positive effect on angling participation.

By using negotiation strategies (Jackson & Rucks, 1995), anglers can adapt their behavior or perceptions to overcome constraints to continue or increase their fishing participation. Cognitive negotiation strategies could include adapting catch satisfaction to changing stock status in a river. Behavioral negotiation strategies could include setting

aside money for fishing, going to other rivers, improving skills, managing time, and finding new fishing partners. Therefore, our second hypothesis was:

H2: Negotiation has a direct positive effect on angling participation.

Even if constraints are lacking, participation is dependent on the potential angler expecting a certain (positive) outcome or satisfaction from fishing. Motivations for participation have been defined by Decker, Brown, and Siemer (2001) as the “cognitive forces that drive people to achieve particular goal states” (p. 47). Jackson, Crawford, and Godbey (1993) addressed the role of motivation in the negotiation process for the first time by stating that “both the initiation and outcome of the negotiation process are dependent upon the relative strength of, and interaction between, constraints on participating in an activity and motivation for such participation” (p. 9). Therefore, our third hypothesis was:

H3: Motivations have a direct positive effect on angling participation.

Fishing motivations are often divided into catch-related and general motives (Calvert, 2002). Common motivation domains in studies of anglers are catching/consuming fish, challenge, relaxation, excitement, socializing, and experiencing nature (Sutton, 2007). Catch motives have not been investigated to the same degree as general motives (Aas & Vittersø, 2000; Beardmore, Haider, Hunt, & Arlinghaus, 2011). Given that motivations differ between anglers (Arlinghaus, 2006; Beardmore et al., 2011), so do the strength and type of domains influencing participation. For example, a “subsistence” angler primarily motivated by consumption could end up fishing less if strict quotas were implemented, whereas a more “conservation-oriented” angler could see this as beneficial and increase participation. High motivations and perceived benefits give a strong incentive to negotiate through the constraints and go fishing (Hubbard & Mannell, 2001). From these studies and in line with White (2008) the following were our fourth and fifth hypotheses:

H4: Constraints/facilitators have a direct positive effect on negotiation.

H5: Motivations have a direct positive effect on negotiation.

Besides motivations and constraints/facilitators, angler negotiation efforts are influenced by individual negotiation-efficacy. For this measure, as in White (2008), we used anglers’ perceived self-efficacy, defined by Bandura (1994) as “people’s belief about their capacity to produce designated levels of performance that exercise influence over events that affect their lives” (p. 71). Perceived self-efficacy in one event may lead to a feeling of self-efficacy when facing other tasks as well (Bandura, 1986). Anglers with higher levels of perceived self-efficacy would probably have a stronger motivation to use negotiation strategies to go fishing. Former studies have also shown that self-efficacy positively influenced negotiation and motivation (Loucks-Atkinson & Mannell, 2007; White, 2008), whereas it had a negative influence on constraints (White, 2008). Therefore, we stated hypotheses six through eight as:

H6: Negotiation-efficacy has a direct positive effect on negotiation.

H7: Negotiation-efficacy has a direct positive effect on motivation.

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H8: Negotiation-efficacy has a direct positive effect on constraints/facilitators.¹

Method

Data collection and sample

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Data were collected using an Internet survey sent to anglers living in Norway who had paid the mandatory Norwegian salmon fishing fee online² at least one of the years 2012–2014 ($n = 61,466$), and further accepted being contacted for such surveys ($n = 51,568$) via e-mail. Anglers were randomly drawn from this register, which contained information such as name, age, e-mail address, home address/country, and for some also telephone number. Out of this 2012–2014 register of 51,658, we drew 10,000 unique names. 160

Q5 The questionnaire was in Norwegian and based on Dillman, Smyth, and Christian's (2009) recommendations for design and construction. Given that some of the variables and constructs were based on theories originally designed in English and had not been used in a Norwegian context before, we had seven researchers (Norwegian) examine the clarity of wording/meaning of constructs for our translation from English to Norwegian. Several questionnaire scales and items had previously been translated from English to Norwegian and used in published studies, so we made sure to use the "established" Norwegian versions (Aas & Vittersø, 2000; Stensland, Aas, & Mehmetoglu, 2013). A pre-notice, main send out, and four reminders were all sent by e-mail (via Questback) with 5–12-day intervals. Data collection lasted from December 16, 2014 to February 10, 2015. We obtained a valid sample of 9,091 after correcting our sample for non-valid e-mail addresses/respondents. The survey yielded $n = 3,635$ responses (response rate = 40%). 165

Q6 A non-response bias check by telephone yielded 445 answers from a valid sample of 687 (response rate = 65%). Thirty-four percent of the anglers in the non-response check claimed they never received the initial e-mail invitation. Of these, two-thirds confirmed that the e-mail address was correct, indicating that the e-mail might have ended up in the junk/spam filter or been over-looked. The remaining 32% had either changed e-mail address (old address still working, but no longer monitored) or the e-mail address used for paying the online fee belonged to another person. This indicates a "true" response rate higher than the 40% we got for the e-mail survey. Nevertheless, non-respondents were generally living in smaller municipalities, had less education, and were more often local anglers (not staying overnight away from home when fishing), compared to respondents. It was also possible to compare the respondents with: (a) those in the contact register and (b) with the gross register also including those who had reserved themselves against being contacted. The anglers responding to our survey were, on average, significantly older ($M = 49.2$ years) than those in the gross register ($M = 47.2$ years). Further 5% of anglers in the sample were females, compared to 7% in the gross register. Results were interpreted with these biases in mind. 175 180 185

Variables

The conceptual model of angling participation was adapted from White's (2008) model of recreation behavior. Factors are displayed in Table 1 and are discussed in the sections that follow.

Participation

This was a first-order factor. Angler participation in Norwegian rivers in 2014 was measured in a similar way as White (2008). The two variables used were the number of angling days in Norwegian rivers in 2014 and the number of Norwegian rivers fished that year (Table 1); both were continuous variables.

Constraints/Facilitators

This was a third-order factor. The items used for measuring what limited ("constraints") or enabled ("facilitators") participation were adapted from previous studies on fishing participation (Aas, 1995; Kuehn et al., 2013; Lyu & Oh, 2015; Sutton, Dew, & Higgs, 2009), Raymore's (2002) work on facilitators, White's (2008) study on outdoor recreation participation, and a review of constraints to outdoor recreation by Walker and Virden (2005). The question asked was (in English translation): "To what extent did the following factors either hinder/limit or enable/increase your participation in salmon fishing in Norway in region/rivers of interest to you in 2014? If some of the factors were of no relevance to you pick 'not relevant' at the right end (e.g., if you have no family obligations). If e.g., probability of catching fish has no effect of how much you fish, pick 0." Answers were given on a 7-point scale: -3 = greatly limited participation, 0 = no effect, + 3 = greatly enabled participation. The scale was recoded to 1–7. The different items are shown in Table 1.

Motivations

This was a second-order factor. Anglers were asked on a seven-point scale (1 = not at all important, 7 = very important) to "mark how important or unimportant each of the listed reasons are for you to fish in your main river." The main river was defined as the Norwegian river they had fished the most in the 5 years up to and including their last season in Norway. The reasons/motivations were measured by 12 variables (Table 1) commonly used in many angler studies (Beardmore et al., 2011; Fedler & Ditton, 1994; Sutton, 2007). Twelve catch and non-catch variables adapted from Beardmore et al. (2011) to Norwegian salmon fishing by Skullerud and Stensland (2013) were used. These variables specifically measured different aspects of keeping fish and the challenge of catching fish, which was seen as important for this study given that salmon stocks have been in decline and restrictions on harvest imposed.

Negotiation efficacy

This was a first-order factor. Anglers were asked the extent they agreed on a seven-point scale with three items about choosing to go salmon fishing in Norway (1 = strongly disagree, 7 = strongly agree). Items were adapted from White (2008) who used Bandura's (1997) self-efficacy as a measure of negotiation efficacy. The items intended to examine three sources of self-efficacy defined by Bandura (1997) are: mastery experience, vicarious experience, and social persuasion (Table 1).³

Table 1. Measurement model results with factors and indicator descriptives and loadings.

	Indicator			
	<i>M</i>	<i>SD</i>	Standardized loading	<i>Z</i> -value
F1 Constraints/Facilitators ¹ (Raykov's reliability coefficient = .847)				
F1.1 Interpersonal			.690	43.48
Having other people to fish with	4.68	1.44	.598	46.02
My family's opinion about my salmon fishing	4.34	1.20	.788	82.61
My friends' opinion about my salmon fishing	4.41	1.12	.815	87.38
F1.2. Intrapersonal			.877	58.30
My knowledge about where to buy/rent good fishing	4.54	1.43	.709	61.20
My personal health situation/fitness/mobility	4.34	1.29	.628	48.91
My fishing skills and abilities	4.51	1.25	.754	68.53
F1.3 Structural			.929	42.42
F1.3.1 Structural1: Obligations			.492	24.27
Amount of time I work and/or study	3.54	1.29	.702	54.63
Extent of family/household obligations	3.66	1.26	.654	48.51
How much time I have for myself free from work/studies/ family obligations	3.71	1.48	.735	57.94
F1.3.2 Structural2: Quality of fishing			.668	36.60
Possibility of fishing good beats/sections/rivers	4.43	1.60	.641	57.40
Size of salmon runs	4.18	1.56	.825	116.69
Probability of catching fish	4.54	1.60	.889	149.48
Catch probability for large salmon	4.51	1.43	.712	75.10
F1.3.3. Structural3: Regulations			.437	22.34
Growth of catch & release in Norwegian rivers	3.81	1.21	.783	42.04
Inreased use of bag limits and harvest quotas	3.80	1.20	.837	43.28
F2 Motivations ³ (Raykov's reliability coefficient = .503)				
F2.1 Motivation1: Challenge			.709	29.41
Catch a big fish	3.80	1.93	.591	45.41
Master angling-related challenges	4.40	1.83	.699	59.06
Experience a challenging fight with the fish	4.71	1.81	.863	81.57
F2.2 Motivation2: Consumption			.313	11.31
Catch as many fish as possible	2.59	1.53	.909	18.95
Generate a supply of fish in the freezer for non-angling times	1.96	1.42	.551	17.62
F2.3 Motivation3: Escape			.462	19.69
Experience nature	5.86	1.34	.638	54.49
Relaxation	6.03	1.23	.901	96.29
Get away from the regular routine	5.80	1.49	.736	70.21
F2.4 Motivation4: Socialize			.415	18.20
Socialize	5.11	1.82	.912	67.62
Be with friends	5.10	1.86	.936	68.32
F3 Negotiation efficacy ² (Raykov's reliability coefficient = .723)				
Own ability to negotiate fishing barriers	4.57	1.85	.794	59.35
Fishing buddies' ability to negotiate fishing barriers	4.51	1.87	.678	49.82
Encouragement from family and friends	4.07	1.87	.569	38.69
F4 Negotiation ² (Raykov's reliability coefficient = .860)				
F4.1 Negotiation1: Changing interpersonal relations			.662	31.81
Find new fishing buddies	2.40	1.61	.649	34.74
Negotiate with family	2.45	1.77	.586	32.36
F4.2 Negotiation2: Fish other rivers and dates			.790	56.65
Go to rivers with more fish	3.09	1.86	.762	85.47
Go to rivers with longer season	2.80	1.81	.785	93.25
Go to less crowded rivers	3.78	2.11	.740	78.93

(Continued)

Table 1. (Continued).

	Indicator			
	<i>M</i>	<i>SD</i>	Standardized loading	<i>Z</i> -value
Fish other periods /dates of season	2.95	1.79	.712	71.25
F4.3 Negotiation3: Skills, knowledge, and money			.958	65.78
Improve fishing skill	4.65	1.93	.660	57.93
Information about fishing access	3.92	1.98	.838	95.31
Set aside money for fishing	3.04	2.00	.663	57.18
F5 Participation (Raykov's reliability coefficient = .559)				
Number of salmon fishing days in Norway in 2014	11.4	14.0	.718	23.85
Number of salmon rivers fished in Norway in 2014	1.77	2.06	.535	21.69

Note. All of the standardized loadings are statistically significant at 0.001. ¹Scale 1–7 where 1 = greatly limited participation, 0 = no effect, 7 = Greatly enabled participation. ²Scale 1–7 where 1 = strongly disagree, 7 = strongly agree. ³Scale 1–7 where 1 = not at all important, 7 = very important.

Initial variables excluded from the factor analysis and not shown in table: On Motivations: To catch fish for a meal with family/friends while on fishing trip, To do something with your family. On Constraints/Facilitators: Costs of salmon fishing in Norway, Travel time to an attractive river /area, Length of fishing season where I would like to fish, My thought about whether it is right or wrong to go fishing for salmon given current stock status. On Negotiation: Organize fishing trips with my own group, Release fish to avoid filling my quota, Use other type of fishing gear/technique (e.g. switch from spoon/spin to fly fishing), Go to salmon rivers that are less expensive.

Negotiation

This was a second-order factor. Anglers were asked the extent they agreed with how different strategies to start, continue, or increase their participation in salmon fishing in Norway fit their actual behavior. Answers were on a seven-point scale (1 = strongly disagree, 7 = strongly agree). The initial 13 statements were developed from prior research on negotiations and angling substitution processes (Aas & Onstad, 2013; Lyu & Oh, 2015; Walker & Virden, 2005; White, 2008).

Measurement model

The measurement model with structural paths (Figure 1) was tested within the structural equation modeling (SEM) framework. In doing so, the two-stage approach to testing a full SEM model proposed by Anderson and Gerbing (1988) was followed. First, a confirmatory factor analysis tested the measurement part and then the structural part was testing using SEM. Both the measurement variables and full SEM model were tested using the maximum likelihood estimation by running the *sem* module of Stata (data analysis and statistical software).⁴ Person mean substitution (PMS) method of imputation replaced missing data values providing a complete sample of 3,597 anglers.⁵

Given that the structural model requires a psychometrically sound measurement model (Byrne, 2012), the convergent and discriminant validity of the latent constructs of the model (i.e., construct validity) were examined (Anderson & Gerbing, 1988). The measurement model contained two first-order factors (Negotiation Efficacy and Participation), and three higher-order constructs, one of which was a third-order factor (Constraints/Facilitators) and the remaining two (Motivations and Negotiation) were second-order factors. In higher-order factor models, the lower-order factors could conceptually be viewed as measures in the same manner as measures of first-order factors (Brown, 2006).

As shown in Table 1, one measure for convergent validity, namely the standardized factor loadings (of the variables reflecting the first-order as well as the higher order constructs), were all

above the commonly used thresholds of .30/.40 for all indicators (Brown, 2006) and statistically significant. Another measure, the amount of variance in the manifest variables captured by each of the latent constructs, was represented by average variance extracted (AVE) values. The AVE values were all close to or above the recommended level of .50 apart from the AVE value of the construct of motivation. Motivation was included as a second-order construct in White's (2008) work and still shared more variance with its indicators than it did with other indicators in the model. Therefore, motivations were a higher-order construct in our model as well. A further measure for convergent validity is the composite reliability, measuring the internal consistency of the indicators. The construct reliability (CR) coefficient used here is Raykov's factor rho coefficient (Kline, 2011), formulated specifically in the context of confirmatory factor analysis (CFA) model.⁶ Raykov's coefficients for the five latent constructs were all above the minimum level of .50. These acceptable measures confirmed the convergent validity of the constructs.

Another characteristic of a good measurement model is that the latent constructs exhibit discriminant validity. Discriminant validity is the extent that a latent construct is truly distinct from other latent constructs (Hair, Black, Babin, Anderson, & Tatham, 2006), demonstrated when the shared variance between the latent construct and its indicators [AVE] is larger than the latent construct's shared variance with the other constructs [squared correlations] (Hulland, 1999). All the AVE values were larger than the squared correlations among the constructs, confirming validity of the latent constructs in the measurement model.

In addition to construct validity, measurement model validity depends on goodness-of-fit (GoF) for the measurement model (Hair et al., 2006). GoF reflects the discrepancy between Σ (predicted variance-covariance matrix) and S (sample variance-covariance matrix) (see Brown, 2006). The smaller this discrepancy is, the better fitting the measurement model (or the structural model for that matter). The model fit measures were RMSEA = .044, CFI = .909, TLI = .900 and SRMR = .047, which are closely in line with the thresholds (RMSEA < .07, CFI/TLI > .92 and SRMR < .08) recommended by Hair, Black, Babin, and Anderson (2013).⁷ Therefore, it was concluded that the measurement model fit the data. Hence, the full structural model could be tested and examined.

Results

Basic sample characteristics

Anglers were, on average, 49 years old⁸ ($SD = 12.80$, range = 16–80, median = 50), male (95%), and 49% completed university/college. For 82% of respondents, 2014 was the last season they fished in Norway, whereas 2013 and before 2013 was the last season for 12% and 6% respectively. On average, anglers reported 13 salmon fishing days in Norway the last season they fished. Anglers were highly experienced and a majority (53%) using fly tackle, yet many also used other tackle (spoon, bait). About half fished mostly near where they lived. Their annual average fishing effort (number of days) for salmon in 2007–2009 was 10% higher than 2013–2014.

Descriptive statistics

When examining how anglers, on average, perceived the listed constraints/facilitators to have impacted their fishing in 2014 (Table 1, Indicator means), we interpreted, in line with

Kuehn et al. (2013), means of 3.80 and below to be constraints, around 4 (3.80–4.20) to have a neutral effect, and 4.20 and above as facilitators. Since there was variation among anglers, one factor perceived as a constraint by one angler could be seen as a facilitator by another. Interpersonal and intrapersonal items were mainly perceived as facilitators, whereas for the subcategories of structural constraint/facilitator, the picture was more divided. The subcategory “Time obligations” was perceived as constraining participation, whereas “Regulations” was a weak constraint to almost neutral. The “Quality of fishing” was a facilitator.

Anglers gave, on average, the negotiating strategies to go fishing a medium to low score. The factor “Skills, knowledge, and money” was seen as most important with the variable “Improving fishing skills” reported most used by anglers. “Fish other rivers and dates” are mainly substitution strategies (Gentner & Sutton, 2008) and here the variable “Go to less crowded rivers” was most used. “Changing interpersonal relations” was not a feasible strategy and received a low score.

Structural model

The goodness of fit measures for the structural model (RMSEA = .045, CFI = .904, TLI = .896, SRMR = .055) were satisfactory. Figure 2 and Table 3 show the standardized coefficients for the hypothesized relationships among the latent constructs of the model. Negotiation efficacy had a significant direct effect on Negotiation (H5, $\beta = .09$), Motivations (H7, $\beta = .46$), and Constraints/Facilitators (H8, $\beta = .29$). Furthermore,

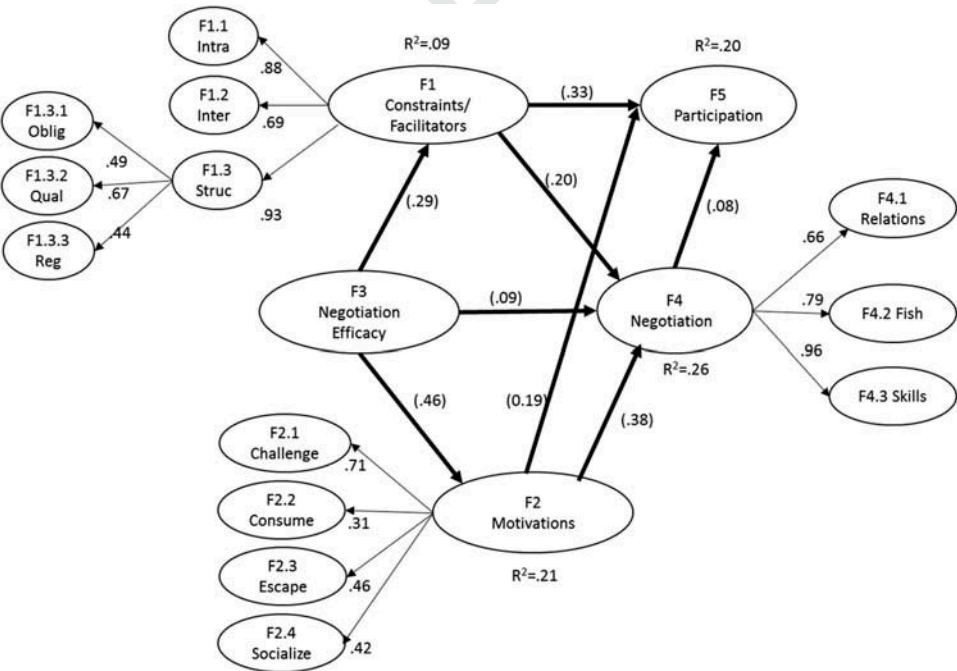


Figure 2. Structural model of salmon angling constraints/facilitators negotiation with standardized parameters.

Table 2. Structural model with direct, indirect and total effects (standardized coefficients) and R²

Endogenous variable	R ²	Exogenous variable											
		Negotiation efficacy			Constraints/facilitators			Motivations			Negotiation		
		Direct	Indirect	Total	Direct	Indirect	Total	Direct	Indirect	Total	Direct	Indirect	Total
Participation	.20	0	.210	.210	.327	.016	.343	.192	.031	.223	.081	0	.081
Negotiation	.26	.094	.231	.325	.199	0	.199	.379	0	.379			
Motivations	.21	.457	0	.457									
Constraints/facilitators	.09	.293	0	.293									

Note. All of the coefficients are statistically significant at .001 apart from the effect of negotiation on participation, which is significant at .05. The indirect effect for each path is obtained using Sobel's method (Sobel, 1987).

Constraints/Facilitators had a significant influence on both Participation (H1, $\beta = .33$) and Negotiation (H4, $\beta = .20$). Moreover, Motivations significantly affected both Participation (H3, $\beta = .19$) and Negotiation (H6, $\beta = .38$). Finally, Negotiation had a significant effect on Participation (H2, $\beta = .08$). These findings supported all of the hypotheses.

In regards the indirect effects, Table 2 shows that Negotiation efficacy had a significant indirect effect ($\beta = .21$) on Participation via Constraints/Facilitators, Motivations, and Negotiation. In addition to its direct effect, Negotiation efficacy had a significant indirect effect on Negotiation ($\beta = .23$) via Constraints/Facilitators and Motivations. It appeared further that Constraints/Facilitators had no substantial indirect effect ($\beta = .02$) on Participation via Negotiation. This finding applied also to the indirect effect of Motivations on Participation via Negotiation. The reported R² values (Figure 2, Table 2) showed that the model explained 20% of the variance in Participation, 26% in Negotiation, 21% in Motivations, and 9% in Constraints/Facilitators.

Constraints, facilitators, and negotiation strategies

Table 1 and Figure 2 showed relationships among variables and constructs. We highlight the following findings: (a) the relative strength of the different lower-order factors making up the constructs of Constraint/Facilitators, Motivations, and Negotiations strategies; and (b) how these factors and variables affect their behavior.

Structural, followed by Intrapersonal and Interpersonal, was the second order factor exerting the largest influence on the construct Constraints/Facilitators. The subcategory “Quality of fishing” (resource situation, catch probability) exerted the largest influence on structural Constraints/Facilitators. “Obligations” and “Regulations” had lower effects. Of negotiation strategies, “Skills, knowledge, and money” had the largest impact followed by “Fish other rivers and dates” and in the end “Changing interpersonal relations.”

Discussion

Our study pursues and expands the work of White (2008) and Kuehn et al. (2013) by incorporating facilitators in a constraint–negotiation model. The structural model confirmed our hypotheses, and supported the conceptual constraints-effects-mitigation model of leisure constraint negotiation documented by others in a different setting (Hubbard & Mannell, 2001; Loucks-Atkinson & Mannell, 2007; White, 2008). Constraints/facilitators

had the strongest impact on angling participation. The main impact was direct, although some indirect influence through Negotiation occurred too. This supports the notion that facing constraints or facilitators triggers two reactions, an inhibitory or furthering reaction on participation by the angler, and a positive indirect reaction on participation from triggering negotiation efforts (Hubbard & Mannell, 2001). 350

Motivations had a moderate direct effect on Participation, and a minor indirect influence through Negotiation. The total effect on Participation from Motivations was somewhat lower than in White (2008), where Motivations had the strongest effect on Participation of all factors. Moreover, Motivations had an effect on Negotiation. Despite this, in line with Loucks-Atkinson (2007) and White (2008), this study supports that motivation is an immediate precursor to participation, as well as potentially triggering the negotiation process. In contrast to White (2008), our study confirmed a significant, but weak, relationship between Negotiation and Participation (H2). However, the direct effect from Negotiation-efficacy on Negotiation was weak (unlike White, 2008). The total effect of Negotiation-efficacy on Negotiation was relatively strong, but occurred mainly indirectly via its influence on Motivations and Constraints/Facilitators. Unlike White (2008) who targeted general outdoor recreationists, this study addressed a specialized niche—salmon anglers. Given that anglers to a greater degree have to deal with (changing) resource conditions and (stricter) regulations that directly affects the activity as well as its outcomes, it is likely that individual Negotiation-efficacy mainly acts indirectly on Negotiation strategies via Constraints /Facilitators, and motivations. Overall, these findings largely echo and confirm the results from White (2008). The observed differences in the strength of relationships among factors might originate from different situational settings (culture, activity, anglers being more specialized) and different measurement variables used. 360 365 370

Out of the three second-order factors, Structural reflected the concept of Constraints/Facilitators the strongest. Walker and Virden (2005) suggested structural constraints, especially time availability, trip costs, and geographic availability to be most important to outdoor recreation activities, but proposed several new categories of structural constraints and more research needed to investigate these constraints. The subcategory “Quality of fishing” (resource situation, catch probability) exerted the largest influence on structural Constraints/Facilitators and belongs to the category “Natural environment structural constraints & facilitators” (Walker & Virden, 2005). In a study of Australian anglers (Sutton, 2007), 70% experienced constraints as (in decreasing order) lack of time, crowding, lack of fishing opportunities/facilities close to home, costs of fishing and equipment, confusing regulations, too strict restrictions, and lack of skills. Metcalf, Graefe, Trauntvein, and Burns (2015) found female hunters to be strongly limited by structural constraints and especially hunting areas being too crowded, closed, inadequate, lacking game, or too expensive. Schroeder, Fulton, Lawrence, and Cordts (2012) also found hunting conditions to be the most severe constraint. These findings are in line with the importance of the “Quality of fishing” domain. Also, “Obligations” (a form of “Social environment structural constraints & facilitators”) and “regulations” (“Institutional structural constraints & facilitators”) had effects. 375 380 385

Of negotiation strategies “Skills, knowledge, and money” were most influential, followed by “Fish other rivers and dates” and of least importance “Changing interpersonal relations.” The importance of negotiation strategies corresponded with the importance of 390

the different structural constraints and facilitators in the model. “Skills, knowledge, and money” are useful for dealing with intrapersonal constraints, but also structural constraints/facilitators, and especially the subcategory “Quality of fishing.” “Fish other rivers and dates” are common substitution strategies of anglers (Gentner & Sutton, 2008) to especially overcome the constraints /facilitators of “Quality of fishing” and “Regulations.” “Changing interpersonal relations” had the lowest impact of negotiation strategies, which corresponds to Interpersonal having the smallest loading on the Constraints/Facilitators construct. In White’s (2008) model, this factor was, however, the most influential strategy and the difference could be due to salmon angling being a more specialized activity where one already belongs to a special subgroup and does not to the same degree change companions. As Schroeder et al. (2012) suggested, the negotiating process may differ between activities and populations. For consumptive activities, the larger spatial-temporal variations in the likely concrete outcomes of the activity (e.g., through quality of fishing and regulations) might explain why Motivations played a more important role than Negotiation and Negotiation-efficacy compared to White (2008).

Limitations, management implications, and future research

As noted earlier, there was a slight difference between survey participants and non-respondents with the latter more frequently living in smaller municipalities, having fewer years of education, and more often being local anglers. Respondents were slightly older than the population mean, and women were slightly underrepresented, implying that participants did not necessarily represent the average Norwegian salmon angler. Also, it is suggested that further studies should expand the measurement of the dependent variable of participation to also include cognitive and affective outcomes (White, 2008). Although the reported R-squared values in the final model can be considered acceptable, yet small, future studies should certainly try to add additional explanatory variables in an attempt to increase prediction. We adopted a covariance-based SEM (COV-SEM) approach to testing our model, but in future methodology-orientated work it would be a good idea to test similar models using the variance-based SEM approach (PLS-SEM) and compare its results to those from COV-SEM.

To increase participation among anglers in the sample, managers and angling providers/landowners can mainly influence structural constraints and facilitators or enhance the use of negotiation strategies. The structural facilitator “Quality of fishing” can be targeted in two ways. First, salmon abundance and natural genetic diversity can be ensured. Governmental authorities have the means to reduce regional threats to salmon stocks both at sea and in rivers. River managers can enhance salmon abundance by maximizing natural smolt production in the rivers through harvest management, habitat management, and habitat improvement (Aas, Policansky, Einum, & Skurdal, 2011). Second, anglers can be provided with longer beats⁹ per permit. Angling providers/landowners can collaborate to merge smaller beats into longer, more attractive beats. This also increases catch probabilities as more fish can be targeted, and a longer beat offers possibilities of fishing well at various water levels (Stensland, 2010).

Of negotiation strategies, “Skills, knowledge and money” was the most influential factor. Offering anglers practical fishing courses or guiding services to improve their fishing skills could be one way to increase participation. To what degree anglers are

willing to pay for such a service or want to improve their skills on their own through magazines, websites, films, and fishing partners is uncertain, as Norwegian anglers are not known for extensive use of guides. The “do-it-yourself” strategy nevertheless indicates usefulness of a website where anglers can find information about how to improve their skills. Salmon angling in Norway is a specialized outdoor recreation activity and a form of niche tourism with thousands of suppliers. Currently, there is no main information channel, thus finding information about where to go besides where one has been fishing so far can be challenging. Information about fishing access should be gathered and made available.

This study addressed active Norwegian anglers. As factors influencing participation vary among groups and settings, other studies investigating salmon angling participation should specifically target foreigners fishing in Norway, lapsed anglers, and non-anglers. Given that the average angler does not exist (Shafer, 1969), more specific investigation of single groups’ perceived constraints and facilitators, motivations, and negotiation strategies (similar to what Metcalf et al. (2015) did for female hunters), could provide valuable information for managers in targeting effective measures to increase angling participation among certain groups.

Notes

1. Given this study uses a constraint–facilitator continuum (from negative to positive) H8 assumes a positive effect.
2. 80–86% of anglers paying the fee any of the years 2012–2014 did so online.
3. Bandura (1997) also includes a fourth type of self-efficacy: physiological and affective states. We had included this in the questionnaire draft. Comments from pretesting about the wording and strangeness of this type as expressed in the Norwegian language made us eliminate it and use our alternative measure consisting of three sub-categories of self-efficacy.
4. We additionally estimated our model using the non-normality robust standard errors (Satorra-Bentler) in Stata. The results did not differ substantially from those obtained from the standard maximum likelihood estimation. Thus, we have chosen to report the results from the latter estimation.
5. The amount of missing data on the observed variables varied between 1% and 22%. PMS was used as it is shown to be a good representation of the original data when the missing data are less than about 20% (Downey & King, 1998).
6. Given that not all readers are accustomed to Raykov’s factor rho coefficients, we also provide Cronbach’s Alpha coefficients in Table 1.
7. There is a clear warning in the SEM literature against accepting/rejecting a model solely based on model fit thresholds. Thus, we first interpreted the parameter estimates according to our theoretical assumptions. Once the parameter estimates made sense, we examined the fit measures. The model fit measures were shown to be acceptable.
8. Note that the range interval is truncated because anglers younger than 16 years (from 2013 on 18 years) do not pay the fee, and therefore are not present in the register. In the survey 80+ years was set as the upper age alternative.
9. A beat is defined as a length of river or bank, let or fished as a unit by angling (McLay & Gordon-Rogers, 1997).

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