

DIFFERENCES IN SCUBA DIVER MOTIVATIONS BASED ON LEVEL OF DEVELOPMENT¹

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Abstract: This study examined SCUBA divers' level of development in relationship to their motivations to dive. During the fall of 1999, 869 divers ranging from beginners to post-experts were surveyed (37% response rate). Respondents ranked 24 motives on a 5-point importance scale. When the data were reduced using factor analysis to tease out major themes, six factors (explaining 60 percent of the variance) emerged: *adventure*, *learn*, *escape*, *social interaction*, *stature*, and *personal challenge*. When mean scores were compared among levels of development using one-way analysis of variance, all six factors differed significantly ($p < .05$). However, when individual motives were compared, not every motive within each factor -- in fact, only 17 of 24 items -- differed by level of development. The results of this study verified that divers with higher levels of development are motivated to pursue the activity for different reasons, but not always as expected. *Adventure* and *learning* followed the predicted curvilinear pattern of increasing importance from beginners to experts and decreasing for post-experts. *Social interaction* displayed the predicted mirror image of that curve. Unexpectedly, *personal challenge* decreased and *stature* and *escape* increased with development.

Introduction

Motivation to participate in a given activity can be explained by expectancy-value theory, which states that motivation is determined by the attractiveness of outcomes and the expectation that participation will result in desired

outcomes. This belief about the likelihood of achieving desirable outcomes fosters a positive attitude and intention to perform a specific behavior. Behaviors that are instrumental for goal achievement are evaluated favorably (Fishbein & Ajzen, 1975).

Expectancy-value theory also states that individuals may have a variety of motives for participating in an activity. Furthermore, persons within that activity may seek totally different outcomes. While some recreation research has focused on motives of those participating in different activities (e.g., the study of cross-country skiers and snowmobilers by Jackson and Wong, 1982), other studies examined the goals of those participating in the same activity (e.g., Ditton, Fedler, and Graefe's 1982 study of types of river floaters).

Since motives have been shown to be influenced by level of past experience (Schreyer, Lime, & Williams, 1984), it seems likely that they would differ by participants' level of development. The theories of specialization (Bryan, 1977; 1979) and amateurism (Stebbins, 1979; 1992) characterize participants' growth and development in leisure activities. Based primarily on outdoor recreationists, Bryan described participants on a continuum ranging from novice to specialist, with stages defined as a function of one's time, money, equipment, skill, and psychic commitment to an activity. Stebbins highlighted changes in "seriousness," where the casual dabbler may eventually progress to an employed professional in the fields of art, entertainment, science, and sport. He described the amateur's development in terms of a career history, with five stages of progression/retrogression: beginning, development, establishment, maintenance, and decline. Using risk recreation activities (e.g., kayaking, climbing, skiing, etc.), Robinson (1992) also focused on commitment to leisure activities. He generated a model for understanding phases and transitions of long-term (enduring) involvement. In each theory, individuals at different stages tended to place importance on, focus on, or strive for different outcomes.

Todd combined aspects of the above theories to operationalize level of development as a single measure. Results for quiltmakers (Todd, 1997; 1999a; 1999b; Todd & Graefe, in press) and SCUBA divers (Todd, 2000) demonstrated that having respondents choose a category of beginner, intermediate, advanced, expert, or "post-expert -- not the expert I once was" provided an adequate reflection of development-related factors. In all but one case, mean scores for indices measuring equipment owned, knowledge, experience, perceived skill, participation, commitment, and amateur/professional growth increased from beginner to expert and then decreased for post-experts. (Diving experience was the only exception to this pattern; due to its cumulative nature, experience level continued to increase for post-experts.)

Schreyer, Lime, and Williams (1984) found that veteran river recreationists ranked motives such as "to develop my skills" and "to test my abilities" much higher than novices. Furthermore, with higher levels of experience, the structure of the motive factors became increasingly complex (Williams, Schreyer, & Knopf, 1990). Going beyond

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experience use history, Kauffman (1984) discovered that motives for canoeing changed as participants became more specialized. Differences between scores for nature, exploration, affiliation, and temporary escape suggested at least two levels of specialization, while even larger differences were found for three other expected rewards. Highly specialized canoeists were found to canoe for exercise, recognized the importance of their equipment to their experience, and received a sense of achievement from their experience. These studies suggest that the more specialized and serious participants are about their leisure pursuits, the more important intrinsic rewards of involvement and competence become.

Purpose of the Study

This study examined SCUBA divers' level of development in relationship to their motivations to dive. It was hypothesized that divers' motives would differ by level of development such that the importance of motives related to the intrinsic rewards of involvement (i.e., challenge, adventure, and learning) would increase from beginners to experts and decrease again for post-experts. Conversely, the importance of more extrinsically-related motives (i.e., stature, social interaction, and escape) was expected to decrease from beginners to experts and increase again for post-experts.

Methods

Data were gathered using two methods: focus group interviews and a mail survey. In June 1999, six focus groups were interviewed in five locations across New York's Great Lakes Region: Buffalo/Niagara Falls, Rochester, Syracuse, Oswego, and Clayton (2 groups). At each location, a key informant assembled 4 to 12 divers representing a wide range of levels of diving development. Using an established protocol, a series of 6 questions was asked; resulting discussion (lasting approximately 90 minutes) was tape-recorded. Major themes were extracted from this data to aid in the development of a written questionnaire. The questionnaire contained sections measuring diving experience, self-evaluation, diving motivations, diving in the previous year, constraining factors, diving expenditures, underwater environmental concerns, diving socialization, and demographic information.

This 16-page questionnaire was mailed to a sample of 2850 active and inactive New York State divers. To generate this sample, a database of approximately 6700 addresses was compiled from various sources, including a national certifying agency (Professional Association of Diving Instructors [PADI]), a statewide organization (New York State Divers Association [NYSDA]), a dive symposium (Great Lakes Underwater III Symposium), a dive shop (Syracuse's National Aquatic Service, Inc.), a non-profit organization (Bateau Below, Inc.), and several dive clubs (Rochester's Rec Divers club, Buffalo Aqua Club, Syracuse University's dive club, and Central New York Dive Club). Addresses were stratified by major regions across the state. Since primary emphasis was placed on contacting divers in the regions closest to the Great Lakes,

all available names from some regions were mailed surveys while a random selection process was used for other regions. The first mailing took place in October 1999, followed by reminder postcards and a second mailing of the survey to non-respondents.

For purposes of this study, respondents were asked to rank 24 motives on a 5-point scale ranging from 1 (not important) to 5 (extremely important). Level of development was operationalized by a self-selected single item; respondents were asked to characterize their current stage of development as a diver by choosing one of the following five categories: beginner, intermediate, advanced, expert, or "post-expert – not the expert I once was."

Factor analysis (principal components method of extraction, varimax rotation) was used to reduce the 24 motives into factors representing primary themes or reasons for diving participation. Cronbach's alpha was then used to test for inter-item reliability among the items in each factor having an Eigenvalue of at least 1.00.

One-way analysis of variance was used to determine if a difference existed among mean scores for each factor by level of development. To compare the differences between mean scores for each pair of developmental levels, Tukey's Honestly Significant Differences (HSD) was used as a post hoc test if the F-value was significant ($p < .05$). To ensure that the scaled factors were not masking the effects of any component statement, each motive was also individually tested using the same procedures.

Results

More than 17 percent of the surveys (490 out of 2850) were returned as either undeliverable or as having been sent to non-divers. While 10 percent is a more common statistic for studies of this sort, a higher rate was not surprising; in order to tap inactive divers for one aspect of the larger project, some of the addresses were at least 10 years old, increasing the chance of outdated information. Of the remaining 2360 potential respondents, 869 surveys were returned for a 37 percent response rate. A non-respondent bias check conducted by telephone revealed that non-respondents did not differ significantly from respondents based on age, gender, education level, number of years spent diving, or level of development. However, significantly fewer non-respondents were certified divers (76 percent versus 97 percent of respondents) or active divers (48 percent versus 69 percent of respondents). Thus it is important to note that diving was likely to have been more salient for respondents than non-respondents when interpreting results.

A profile of the respondents revealed that 80 percent were male. Although the average age was 43, ages ranged from 12 (the minimum age of dive certification) to 80. In general, respondents were well educated and had lucrative jobs. Half of the respondents had received 2- or 4-year college degrees, while another fourth had earned advanced degrees. Fifty percent reported earning more than \$60,000 in yearly household income.

When all responses were considered regardless of level of development, the most important motives were related to the diving environment or to the thrill of diving itself. Similar to the findings of Ditton and Baker (1999), the top dive motive was *to look at underwater animal and plant life* (mean of 4.2), followed by *to explore things* (4.1), *for the adventure of it* (3.9), *because it is stimulating and exciting* (3.8), and *to learn more about the underwater environment* (3.7). (See Table 1.) Rated at the bottom of the list were reasons that may have been influenced by societal pressures and norms; these items were related to “showing off” (e.g., *it’s sort of an impressive thing to do* [mean of 2.1] and *to use my equipment* [2.6]) or tended to project an image that divers want to dispel as public perception (e.g., *to collect interesting artifacts* [2.4] and *because of the risk involved* [1.7]). The lowest rated item reinforced the notion that perception of risk depends largely on degree of involvement; those who actually participate in the activity consider it safe, while those who are “outsiders” view it as risky.

Table 1. Motives for Diving Participation

Motive	Mean	sd
To look at underwater animal and plant life	4.2	.90
To explore things	4.1	.80
For the adventure of it	3.9	.96
Because it is stimulating and exciting	3.8	1.04
To learn more about the underwater environment	3.7	1.07
To develop my diving skills and abilities	3.6	1.02
For relaxation	3.6	1.17
To experience peace and tranquility	3.4	1.24
For a change from everyday life	3.4	1.16
To gain an experience I can look back on	3.3	1.21
To see historically significant shipwrecks	3.2	1.35
Because I thought it would be a challenge	3.0	1.14
So I could do things with my friends and/or family	3.0	1.29
To give me a feeling of confidence in myself	2.8	1.25
To help keep me physically fit	2.8	1.21
To meet new people	2.8	1.20
To share my skill and knowledge with others	2.7	1.25
To do something creative, such as take pictures or videos	2.7	1.33
To show myself that I can do it	2.7	1.33
To study underwater geological formations	2.6	1.26
To use my equipment	2.6	1.25
To collect interesting artifacts	2.4	1.28
It’s sort of an impressive thing to do	2.1	1.12
Because of the risk involved	1.7	1.03

Values are mean scores on a 5-point scale as follows: 1=not important, 2=slightly important, 3=moderately important, 4=very important, and 5=extremely important.

When these data were reduced using factor analysis to tease out major motivational themes, six factors (explaining 60 percent of the variance and having acceptably high scale reliabilities) emerged: *adventure* (with the highest mean scale score of 3.9, reliability coefficient or Cronbach’s alpha of .81), *learn* (3.5, alpha of .71), *escape* (3.3, alpha of .72), *social interaction* (3.0), *stature* (2.7, alpha of .71), and *personal challenge* (2.6, alpha of .81). As shown in Table 2, the *personal challenge* theme emerged as the strongest factor, explaining nearly 30% of the variance. This factor was highlighted by 6 items related to challenging and proving oneself, as well as highlighting diving as a slightly impressive, risky experience. The *stature* factor added an additional 10% of explained variance. Similar to Ewert’s “image” factor (1993), this theme was characterized by 6 “visible” outcomes of diving, the external “tangible” results about which a diver could possibly “brag.” The 4 items in the *escape* factor (nearly 7% of explained variance) encompassed not only relaxation, peace, and tranquility, but also escaping everyday life and everyday people. The *learn* factor (5% of the variance) included 4 items revolving around the natural environment plus developing diving skills and abilities. Another 5% of the variance was explained by the 3 items in the *adventure* factor, and the final factor consisted of a single item related to being with others (*social interaction*).

Of the 847 respondents who selected a category to represent level of development, 198 were beginners, 267 marked intermediate, and 250 were advanced. Only 77 considered themselves to be experts and just 55 labeled themselves as “post-expert” divers. (See Figure 1.)

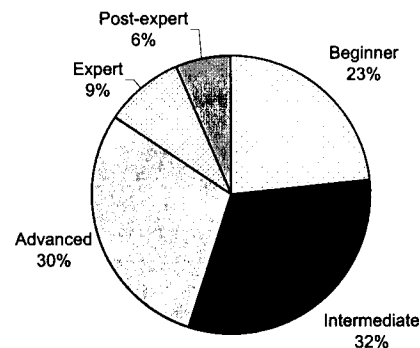


Figure 1. Level of Development

When mean motive scores were compared among levels of development using one-way analysis of variance, all six factors produced significant F-values ($p < .05$). While three factors (*learn*, *adventure*, and *social interaction*) were only able to reveal one significant difference using Tukey’s HSD post hoc test, the *stature* factor was the most discriminating, uncovering eight significant differences among levels of development. The remaining two factors fell in between, with *personal challenge* detecting four differences and *escape* finding three. In order to discover if the factors were masking or hiding the effects of any of the individual motives, not only each factor but also its respective items were tested (see Table 3).

**Table 2. Results of Factor Analysis of Motive Items
(Principal Components Extraction, Varimax Rotation)**

Factor Name and Item Content/Loading	Factor 1: <i>Personal Challenge</i>	Factor 2: <i>Stature</i>	Factor 3: <i>Escape</i>	Factor 4: <i>Learn</i>	Factor 5: <i>Adventure</i>	Factor 6: <i>Social Interaction</i>
To show myself that I can do it	.82					
Because I thought it would be a challenge	.72					
To give me a feeling of confidence in myself	.71					
Because of the risk involved	.62					
It's sort of an impressive thing to do	.62					
To gain an experience I can look back on	.57					
To see historically significant shipwrecks		.76				
To share my skill and knowledge with others		.68				
To use my equipment		.61				
To collect interesting artifacts		.58				
To help keep me physically fit		.51				
To do something creative, such as take pictures or videos		.44				
For relaxation			.77			
For a change from everyday life			.65			
To experience peace and tranquility			.63			
To meet new people			.45			
To learn more about the underwater environment				.82		
To look at underwater animal and plant life				.76		
To study underwater geological formations				.50		
To develop my diving skills and abilities				.43		
For the adventure of it					.72	
To explore things					.61	
Because it is stimulating and exciting					.53	
So I could do things with my friends and/or family						.80
Eigenvalue	7.15	2.32	1.60	1.60	1.08	1.01
Proportion of variance explained	29.8%	9.7%	6.7%	5.1%	4.5%	4.2%
Cumulative variance explained	29.8%	39.5%	46.2%	51.3%	55.8%	60.0%
Mean scale importance score	2.7	2.7	3.3	3.5	3.9	3.0
Cronbach's alpha	.81	.76	.72	.71	.71	--

Table 3. Motivation Factors and Individual Motives: One-way Analysis of Variance Using Mean Scores of Divers with Different Levels of Development

Statement	Total (n=847)	Level of Development					F	p <	# of Differences Detected
		Beginner (n=198)	Intermediate (n=267)	Advanced (n=250)	Expert (n=77)	Post-expert (n=55)			
FACTOR 1: PERSONAL CHALLENGE	2.61	2.77^a	2.67^{ac}	2.51^{bc}	2.27^b	2.71^{ac}	6.28	.0001	4
To show myself that I can do it	2.69	3.18^a	2.84^b	2.35^c	2.03^c	2.63^{bc}	17.81	.0001	6
Because I thought it would be a challenge	2.99	3.05	3.01	2.96	2.82	3.00	0.61	.66	n.s.
To give me a feeling of confidence in myself	2.81	2.90	2.84	2.79	2.52	2.89	1.40	.23	n.s.
Because of the risk involved	1.73	1.86^a	1.76^a	1.68^{ab}	1.38^b	1.81^{ab}	3.42	.01	2
It's sort of an impressive thing to do	2.14	2.29	2.15	2.02	1.91	2.35	2.92	.05	0
To gain an experience I can look back on	3.31	3.34^{ab}	3.40^a	3.25^{ab}	2.97^b	3.56^a	2.67	.05	2
FACTOR 2: STATURE	2.72	2.29^a	2.58^b	2.96^c	3.12^{cd}	3.30^d	33.95	.0001	8
To see historically significant shipwrecks	3.16	2.41^a	2.96^b	3.58^c	3.83^c	3.93^c	37.59	.0001	7
To share my skill and knowledge with others	2.74	2.15^a	2.46^b	3.01^c	3.72^d	3.53^d	40.64	.0001	9
To use my equipment	2.56	2.17^a	2.59^b	2.78^b	2.64^b	2.76^b	7.42	.0001	4
To collect interesting artifacts	2.38	2.10^a	2.17^a	2.62^b	2.52^{ab}	3.13^c	11.95	.0001	5
To help keep me physically fit	2.76	2.41^a	2.72^b	2.89^b	2.94^b	3.33^c	8.60	.0001	5
To do something creative, such as take pictures or videos	2.74	2.49^a	2.61^a	2.87^{ab}	3.09^b	3.13^{ab}	5.53	.001	4
FACTOR 3: ESCAPE	3.27	3.05^a	3.27^b	3.38^b	3.27^{ab}	3.57^b	5.77	.0001	3
For relaxation	3.58	3.17^a	3.61^b	3.76^b	3.75^b	3.82^b	8.93	.0001	4
For a change from everyday life	3.36	3.23	3.41	3.42	3.13	3.63	2.31	.06	n.s.
To experience peace and tranquility	3.38	3.17^a	3.36^{ab}	3.46^{ab}	3.49^{ab}	3.73^b	2.84	.05	1
To meet new people	2.76	2.60^a	2.72^{ab}	2.86^{ab}	2.69^{ab}	3.11^b	2.67	.05	1
FACTOR 4: LEARN	3.54	3.42^a	3.50^{ab}	3.64^b	3.65^{ab}	3.59^{ab}	2.88	.05	1
To learn more about the underwater environment	3.72	3.63	3.65	3.80	3.75	3.89	1.32	.26	n.s.
To look at underwater animal and plant life	4.18	4.20	4.21	4.21	4.04	4.02	1.08	.36	n.s.
To study underwater geological formations	2.65	2.40^a	2.58^{ab}	2.79^b	2.99^b	2.80^{ab}	4.48	.001	2
To develop my diving skills and abilities	3.60	3.42^a	3.54^{ab}	3.74^b	3.81^b	3.64^{ab}	3.84	.01	2
FACTOR 5: ADVENTURE	3.92	3.74^a	3.92^{ab}	4.03^b	4.00^{ab}	3.92^{ab}	4.47	.001	1
For the adventure of it	3.86	3.75	3.87	3.97	3.91	3.69	1.96	.10	n.s.
To explore things	4.13	3.87^a	4.10^b	4.26^b	4.35^b	4.30^b	9.30	.0001	4
Because it is stimulating and exciting	3.77	3.61	3.80	3.87	3.75	3.76	1.84	.12	n.s.
FACTOR 6: SOCIAL INTERACTION (So I could do things with my friends and/or family)	2.96	2.93^{ab}	3.12^a	2.92^{ab}	2.62^b	3.00^{ab}	2.49	.05	1

Means with different superscripts are significantly different (see p-level). Values are mean scores on a 5-point scale ranging from not important (1) to extremely important (5).

Within the *personal challenge* factor, the individual items related to challenge and confidence did not vary significantly by level of development; all divers tended to rate these two motives around 2.9 on the 5-point importance scale. *To show myself that I can do it* was actually the most discriminating item. However, the pattern of mean scores for all items harboring significant differences was exactly opposite of what was predicted: the scores tended to actually decrease from beginner to expert stages and increase again for post-experts (see Figure 2a).

In the *stature* factor, all items produced a significant F-value, with sharing skill and viewing shipwrecks as the most discriminating individual items. However, once again, the pattern was unexpected. Instead of decreasing, mean scores tended to increase linearly from beginners to post-experts. (See Figure 2b.)

For the *escape* factor, all divers tended to seek change from everyday life regardless of developmental level. Relaxation was the most telling item within the factor, showing four differences among levels of development. As shown in Figure 2c, the general trend of mean scores was, once again, not what was predicted.

Learning was valued relatively equally among all levels of development. All divers want to look at and learn about the underwater environment. For the remaining items that did have significant F-values, a pattern finally emerged resembling what was hypothesized for the intrinsically motivating *learn* factor: beginners sought to *study underwater geological formations* and to *develop their diving skills and abilities* to a lesser degree than either advanced or expert divers (Figure 2d).

The same could be said for the *adventure* factor. Here, exploration was the deciding item in this factor, uncovering four significant differences. Although not strong, the predicted pattern for this intrinsically motivating theme was somewhat evident (Figure 2e), with beginners having significantly lower scores than all other levels of divers.

Only one significant difference was detected for the *social interaction* item, and the trend displayed by the data followed the predicted pattern of being least important for experts. (See Figure 2f.)

Conclusions and Implications

First, this study showed that diver motivations do differ by level of development, but not always as expected. The study verified that divers with higher levels of development are motivated to pursue the activity for different reasons, placing more importance on *adventure*, *learning*, *stature*, and *escape* and less importance on *social interaction* and *personal challenge*. All six factors had significant F-values, and examination of each of the 24 individual motives revealed that 17 items differed by level of development. Generally, beginners stood out from the rest, scoring significantly lower than other divers for all themes except those related to *personal challenge*.

Trends in the data showed that the hypothesis was supported direction-wise in only half of the cases. *Adventure* and *learning* followed the predicted curvilinear pattern of increasing importance from beginners to experts and decreasing for post-experts. The extrinsic *social interaction* motivation displayed the predicted mirror image of that curve.

However, unexpectedly, internal *personal challenge* decreased, and external motives of *stature* and *escape* actually increased with development. Theory postulates that participants with more experience, skill, etc. will continue to seek out new challenges to peak their interest and commitment. (The risk element of *personal challenge* is one exception; as Ewert [1993] displayed, the importance of risk tends to decrease with experience.) When considering *stature*, however, the idea that leisure activity becomes more intrinsic with experience, or done for its own sake, was not supported. Even the one item in this factor that declined for post-experts was somewhat odd. Stebbins (1979, 1992) explained that post-experts move toward sharing with and teaching others as a way to stay involved in a leisure activity once they are in a stage of decline. One explanation for this anomaly may be that, since diving requires a very unique underwater environment, one must be able to physically do the activity in order to teach it, precluding some post-expert divers from sharing their knowledge.

Second, with the exception of the *personal challenge* factor, not all motives within a motive category or factor differ significantly by level of development. Specifically, individual motives related to challenge, confidence, change, looking at and learning about the environment, adventure, and excitement were rated similarly in importance by all divers, regardless of developmental stage.

In sum, it seems that diving is a unique type of leisure activity in terms of motivation. Beginners may initially be drawn to the activity to challenge themselves; however, once the skills and abilities are developed, divers seem to be motivated by the stature of the activity and the visible outcomes associated with it. Besides conflicting with the intrinsic nature of leisure theory, this also somewhat contradicts impressions given by focus group data. Many interviewees stressed that divers often hide the fact that they dive for fear that the public will label them as crazy risk seekers. Many divers, however, began diving with a generation inspired by the television show *Sea Hunt*; this group also heavily emphasized "trophy hunting" and collecting artifacts to display from their adventures, laying a strong foundation to explain the importance of the stature factor.

If it is known how motives differ by level of development, two groups in particular can make great use of that information. First, resource managers, tourism professionals, and community developers could use this information to facilitate planning and promotion of various dive sites, highlighting which outcomes would most likely be satisfied. Likewise, dive shops, clubs, and instructors could better facilitate participants' needs and experiences.

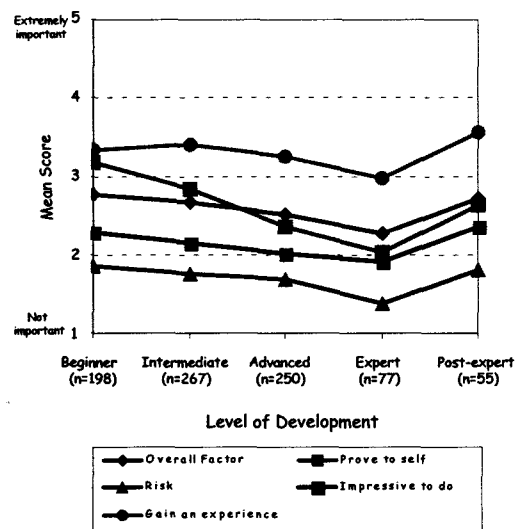


Figure 2a. Personal Challenge Factor by Level of Development

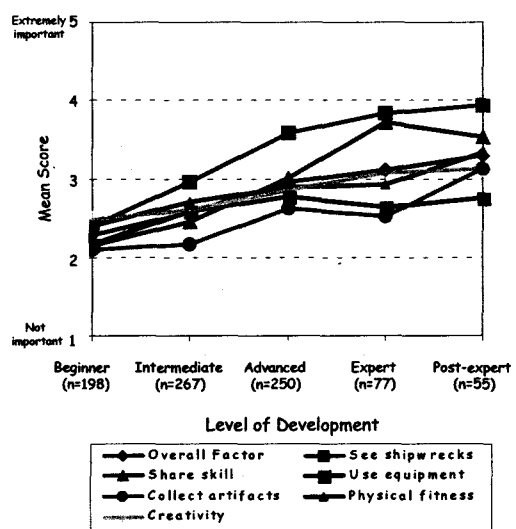


Figure 2b. Stature Factor by Level of Development

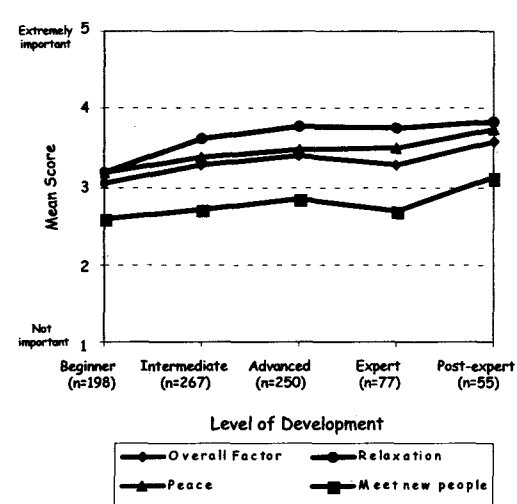


Figure 2c. Escape Factor by Level of Development

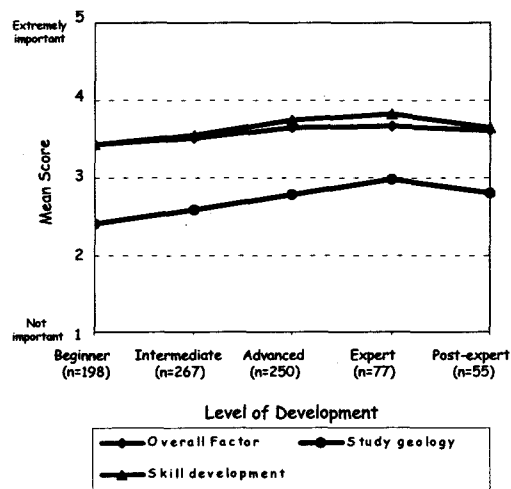


Figure 2d. Learn Factor by Level of Development

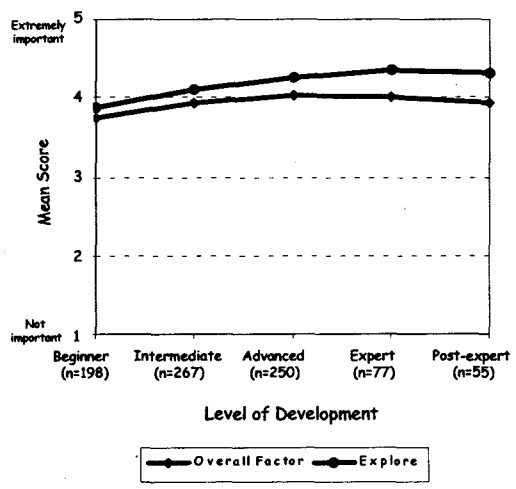


Figure 2e. Adventure Factor by Level of Development

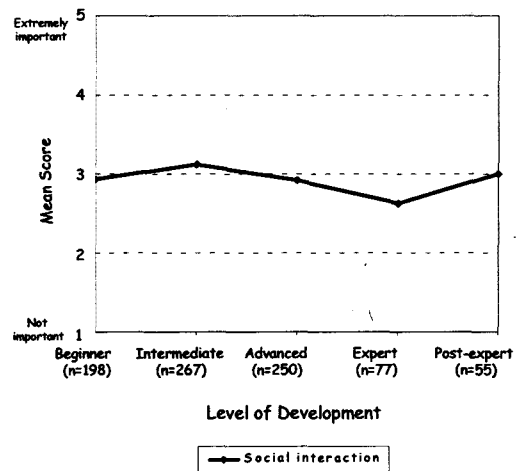


Figure 2f. Social Interaction Factor by Level of Development

From a research perspective, even more light could be shed on how motives change by linking that information to perceived constraints and discontinuance behavior. According to expectancy-value theory (Fishbein & Ajzen, 1975), being unsuccessful at negotiating constraints could affect one's belief about the likelihood of achieving desirable outcomes, in turn fostering a negative attitude and reduced intention to perform a specific behavior. Confirming this, Ewert (1993) found that novice climbers who failed to reach the summit consistently reported lower levels of importance for all motives.

Previous investigations showing significant differences in motives based on different levels of development have primarily focused on experience use history, with motives measured at one snapshot in time (e.g., Schreyer et al., 1984; Williams et al., 1990). Todd's study of quiltmakers (2001) is a rare example of following the same participants over time and using more than experience to indicate developmental level. Results showed that after four years, quiltmakers who had progressed to a higher level of development were able to keep their motives at a consistent level, relying significantly less on quilting to help them work through grief or problems. Quiltmakers who stayed at the same level or even retrogressed, however, seemed to have significantly less "drive" and "control" in their lives.

Longitudinal studies of divers would enable investigators to overcome the most serious limitation of this cross-sectional study: determining whether divers' motives actually change over time. Such studies could contribute to understanding the link between internal cognitive states (attitudes, feelings, and motives) and leisure behavior.

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