Running Head: IDPA & FLOW

Competitive Pistol/Revolver Shooting: Getting Into Your Zone by Understanding Flow

Dr. Bruce A. Larson

Western Kentucky University

About the Author

Dr. Bruce A. Larson is a Professor at Western Kentucky University located in Bowling Green, Kentucky. He is in his 15th year of teaching in the Physical Education and Recreation department and is the program coordinator for the Sport Management degree program. Prior to beginning his career in higher education Dr. Larson served in the United States Marine Corps as an 81mm motor forward observer attached to an infantry line company from 1979 to 1983. He is a veteran of the U.S. Multinational Peacekeeping Force in Beirut Lebanon having served in that country from February to June of 1983. Dr. Larson is also an active member of IDPA and shoots with two clubs in Columbia and Bowling Green Kentucky.

Questions regarding the study findings and the concept of flow in the shooting sports should be directed to Dr. Larson using the following information.

Dr. Bruce A. Larson
Western Kentucky University
1906 College Heights Blvd. #21090
Bowling Green, KY. 42101
(270) 745-2211
bruce.larson@wku.edu

Introduction & Literature Review

Competitive shooters, whether it's International Defensive Pistol Association (IDPA) or other shooting sports, endeavor to discover the psychological reasons behind a person's ability to shoot well on a consistent basis. A psychological construct exists that has been researched extensively which attempts to discover the process an individual goes through in order to have a peak experience. This psychological construct has been identified as flow (Csikszentmihalyi, M. 1990, Csikszentmihalyi & Jackson 1999, Jackson, S.A. 1993 & 1995, Jackson, S.A. & Csikzentmihalyi, M. 1999, Flood, S. & Hellstedt, J. 1991, Nocholls, R.A., Holt, L.N., Polman, C.J. & Remco, 2003, Russell, W.D., Takuya, S. & Inomata, K. 2005, William, D.R. 2001, & Young, A.J. & Pain, D.P. 1999)

Csikszentmihalyi, a psychologist by training, (1975, 1990 & 1999) outlines the process, or stages, that an individual experiences during an event that requires a level of concentration beyond the norm. Csikszentmihalyi (1975) states that people can experience flow at both the micro and macro level. The difference between the two is that micro flow experiences tend to fall into the everyday occurrences of life whereas macro flow experiences are found most often during events that require higher complex demands on the participant. Csikszentmihalyi (1990) & Csikszenthihalyi & Jackson (1999), essentially, identified nine (9) constructs that occur when a person is in a state of flow. These constructs, if achieved, could potentially lead to a peak (AKA being in the zone) performance and, in the case of IDPA shooters, a potentially faster time. The nine constructs are presented along with a brief introduction to the meaning of each construct.

Jackson and Eklund (2004) and Jackson and Csikszentmihalyi (1999) provide a concise overview of the nine constructs and have identified them as: 1. Challenge skill balance, 2. action-

awareness merging, 3. clear goals, 4. unambiguous feedback, 5. total concentration on the task at hand, 6. sense of control, 7. loss of self-consciousness, 8. transformation of time, and 9. autotelic experience. The following explanations were taken from the work Csikszentmihalyi (1990) and Jackson & Csikszentmihalyi (1999).

Challenge skills balance refers to a balance that is matched between the person and skill level required of the event. However, Jackson & Csikzentmihalyi (1999) state that to really experience flow a person must be "extending" themselves to new levels. It is not enough to stay within a comfort zone for the competition. The concept requires the individual to stretch themselves enough while maintaining a attitude that the challenge can be met. If the challenge is too great the person will, according to Csikzentmihalyi's research, experience some level of anxiety. On the other end of the spectrum, if the person's challenge does not meet with the individual's skill level it may lead to boredom. Jackson and Csikzentmihalyi (1999) further espouse that it is what the individual believes they can do that matters most regardless of the person's actual skill and abilities.

Action awareness merging involves the mind-body connection where the individual is in effortless tune with their body's actions. Jackson and Csikzentmihalyi (1999) state that this can only occur when the individual is totally engrossed in the activity they are participating in. Jackson and Csikzentmihalyi further explain that the athlete(s) tend to believe their actions are natural and spontaneous. This should lead the athlete/competitor to a heightened sense of the timing of their movements.

The third component that may help an individual attain a flow experience is the establishment of clear goals. The theory behind this component of flow states that when a person establishes clear goals it allows the individual to focus and avoid distractions that may occur

during the course of competition. There are two parts to the goal process. First, the individual should have an established plan of what they intend to accomplish in the competition. The second part involves the imagery or thought of the athlete that their performance during the competition will be excellent.

The fourth component of the flow experience pertains to the unambiguous feedback that should be present in order to give the competitor information related to how their performance is taking shape. The feedback can take many forms and may include, but not be limited to, kinesthetic awareness, other competitors, a friend, spectators, your equipment, and the setting itself. It appears that individuals are more, when experiencing flow, aware of how their progress is going compared to the goals previously set.

Having total concentration on the task at hand is the fifth component of the flow experience. Individuals typically state that they were able to focus on the task while at the same time being able to drown out background noise that may cause interference. Typically the individual could recall the movements and skills of that particular event but, would not be able to communicate what other competitors were doing, or what the crowd was doing during their time on the course of fire. It seems that when individuals are within this component they are able to make the other competitors and spectators be part of the experience.

When the competitor expresses feelings that they were on their game or that they couldn't miss a shot at a 1,000 yards they are making statements consistent with having a sense of control. This is the sixth component of the flow experience. They may feel that they can't be beat or feel like no matter what they do nothing can go wrong. An important part of this process is the individual's belief that they possess the required skills to complete the scenario.

The seventh component of the flow experience requires the individual to have a loss of

self-consciousness or a loss of negative self-talk. Participants are so focused at the task of completing the scenario that they don't have time to entertain thoughts of self-concern or self-doubt.

Experiencing a transformation of time describes the eighth component of the flow experience. It basically is an alteration in how the individual perceives the passing of time during their event. Individuals will experience this in total opposite directions where some perceive that time is standing still, while others will experience a speed up of time. Those who participate in speed or timed events may perceive that time appears to elongate. If the event were to last for many hours then the perception may be that time speeds up.

The last component of the flow experience revolves around what Csikzentmihalyi refers to as an autotelic experience. This component requires the individual to participate in the activity for no other extrinsic reason other than the intrinsic pleasure that participating brings them. This would be the fun aspect of the flow experience where individuals may have euphoric feelings and self-talk. When an individual has a flow experience it allows the individual to, perhaps, perceive their actions as faultless and that is why they continue to participate.

Purpose of the Study

The purpose of the study was to complete exploratory research on the flow experience of competitive shooters. There were two objectives for this study. First, the study attempted to determine if a competitive shooting sport lead individual shooters in a flow experience as defined by Chisikszentmihalyi (1990). The second objective of the study was to determine if differences in a flow experience exist between the various ages, practice times, and skill levels of shooters.

Methodology

Selection of the Subjects

Subjects for the study were participants at the International Defensive Pistol Associations 2007 national competition held in Allentown, Pennsylvania. Participants were asked to voluntarily participate in the study immediately following the completion of their stages of fire for the competition. Total study participants equaled 110. Demographic data for the study participants is presented in the following tables.

What is your Sex?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	99	90.0	90.0	90.0
	Female	11	10.0	10.0	100.0
	Total	110	100.0	100.0	

Table 1: Frequency Distribution of Participants by Sex

Which age group do you belong in?

Age Group	Frequency	Percent	Valid Percent	Cumulative Percent
18 to 26	14	12.7	12.7	12.7
27 to 35	29	26.4	26.4	39.1
36 to 45	25	22.7	22.7	61.8
46 to 55	23	20.9	20.9	82.7
56 to 64	16	14.5	14.5	97.3
65 +	3	2.7	2.7	100.0
Total	110	100.0	100.0	

Table 2: Frequency Distribution of Participants by Age Group

What level of shooter would you classify yourself as?

Classification	Frequency	Percent	Valid Percent	Cumulative Percent
Novice	20	18.2	18.2	18.2
Marksman	18	16.4	16.4	34.5
Sharpshooter	33	30.0	30.0	64.5
Expert	22	20.0	20.0	84.5
Master	17	15.5	15.5	100.0
Total	110	100.0	100.0	

Table 3: Frequency Distribution of Participants by Shooter Classification

What caliber of pistol or revolver do you shoot?

Caliber	Frequency	Percent	Valid Percent	Cumulative Percent
38	1	.9	.9	.9
9mm	72	65.5	65.5	66.4
40	11	10.0	10.0	76.4
45	25	22.7	22.7	99.1
5	1	.9	.9	100.0
Total	110	100.0	100.0	

Table 4: Frequency Distribution of Participants by Caliber of Pistol/Revolver

How many hours per week do you spend practicing?

Hrs Practice	Frequency	Percent	Valid Percent	Cumulative Percent
0 to 2	59	53.6	53.6	53.6
3 to 5	32	29.1	29.1	82.7
6 to 8	12	10.9	10.9	93.6
9 to 11	3	2.7	2.7	96.4
11 +	4	3.6	3.6	100.0
Total	110	100.0	100.0	

Table 5: Frequency Distribution of Participants by Hours of Practice

Instrumentation: The Flow States Scale

For the purposes of this study the Flow State Scale and specifically the Event Experience Scale (FSS-2) was chosen for its use in determining flow of individuals who have just completed an activity or experience (Jackson & Eklund 2004).

The instrument was developed in response to the need to be able to quantifiably measure the flow experience. It is intended to evaluate a person's flow experience within a particular event or activity. The FSS-2 specifically assesses the individuals flow experience of an activity or event that they have just completed.

The FSS-2 has 36 questions grouped into each of the nine constructs of the flow experience. There are four (4) questions in each of the following constructs: 1. Challenge-Skill Balance, 2. Action-Awareness Merging, 3. Clear Goals, 4. Unambiguous Feedback, 5. Concentration on the Task at Hand, 6. Sense of Control, 7. Loss of Self-Consciousness, 8. Transformation of Time, and 9. Autotelic Experience. Psychometric properties for this instrument have been developed by the authors of the instrument. The psychometric properties consist of the questionnaire reliability and validity. Reliability is a measure that determines whether the questionnaire will be answered consistently over time. Reliability scores of .75 or higher would indicate a reliable questionnaire. Validity is a measure to determine if the questions asked elicit the responses desired by the questionnaire.

Jackson and Marsh (1996) reported in this study that the flow state scale was given to 394 adult athletes. A confirmatory factor analysis revealed that the fit of the 36 item scale was satisfactory and the original 54 item scale was marginal. Additionally this study reported better reliability measures for the 36 item scale compared to the original 54 item scale. Factor loadings were reported between .56 to .88 with a median load of .74.

Reliability measures of the FSS-2 reported in Jackson and Eklund (2004) work indicate more than acceptable alphas indicating reliability. The reported alphas ranged from.72 to .92 across several studies.

The FSS-2 demonstrated acceptable construct validity across several studies (Jackson & Marsh, 1996; Marsh & Jackson, 1999; Jackson et al., 2001; and Jackson & Eklund, 2002). The fit values of the studies ranged from .89 to .93 across these studies.

Data Collection

During the 2007 International Defensive Pistol Association's national competition held in Allentown Pennsylvania data was collected from participants. Each morning during the day's safety meeting the researcher was given time to explain the research to the day's competitors. Immediately following the presentation of the purposes of the study individuals were solicited to voluntarily complete the FSS-2 questionnaire within 1 hour of finishing their match. A table was set up in the main competitor tent where the participants could stop by and complete the questionnaire.

Data Analysis Procedure

In order to determine if the competitors were successful in attaining a flow experience during the pistol/revolver shooting competition a single global mean score for flow for each participant was calculated using a statistical software program named Statistical Packages for the Social Sciences (SPSS). Additionally, each of the nine constructs that make up the global flow states scale score was analyzed to determine if differences existed between various groups. The 36 items on the Flow States Scale-2 can be scored from 1 to 5 where 1 represents disagreement with the statement and 5 indicates agreement. The total possible points for the 36 items on the FSS-2 would be 180 points. There are 4 questions for each of the 9 constructs of the flow states scale. If the analysis demonstrates a low score it would be suggestive that the person's experience in the event was not within the realm of flow. However, a higher score could suggest that the person was experiencing flow during the event.

Using SPSS the correlation procedure was completed to determine if any strong relationships existed between the global and construct mean scores of the FSS-2. Before the correlation analysis was completed a screen was completed of the data to insure that no outliers that could provide disingenuous results were present. Additionally, the ANOVA procedure was

utilized to determine if there were any differences between the shooters based upon the demographics of sex, age, level of shooter, caliber the shooter used, and the number of hours they practiced. Furthermore, the ANOVA procedure tested the homogeneity of variance of the individual groups within the study. The post-hoc procedure was utilized to determine which groups differed in the global and construct scores of the FSS-2. Confidence level for all tests was set at the .05 level.

Data Analysis Results

There was a positive correlation between participant's age and their total mean score on the FSS-2, $r = .208$, $p = \leq .03$.

An analysis of variance (ANOVA) showed that the participant's age was a significant factor in the global mean score on the FSS-2 scale, ($F(5,104) = 2.62$ $p = .054$). indicating that as a person ages their score tended to decrease.

Secondly, the ANOVA demonstrated that the participant's age was a significant factor in the FSS-2 construct mean scores on challenge-skill balance, ($F(5, 104) = 2.35$ $p = .046$), action awareness merging, ($F(5, 104) = 1.38$ $p = .018$), and loss of self-consciousness, ($F(5, 104) = 2.93$ $p = .016$. This also indicates that as a person ages their flow score tends to increase.

Third, the ANOVA procedure established that a shooters classification was a significant factor in the participants FSS-2 construct mean scores on the challenge-skill balance, ($F(4, 104) = 3.47$, $p = .011$, and the action awareness merging, ($F(4, 104) = 3.49$, $p = .010$. Post hoc bonferri tests demonstrated that master level shooters experience flow at a greater level than novice ($p = .015$, and marksman shooters ($p = .034$). This would indicate that progression in the classification would lead to a better chance at attaining a peak experience in competition.

Lastly, the ANOVA procedure confirmed that the amount of practice performed was a significant factor in the FSS-2 construct mean scores on establishing clear goals, ($F(4, 104) = 2.45$, $p = .051$), and the transformation of time, ($F(4,104) = 2.53$, $p = .044$. This, of course, would indicate that the more practice a person devotes to the sport the better chance they have of having a peak shooting experience.

Discussion and Recommendations

The purpose of this study was to explore and determine if competitive shooters experience flow as a result of participation in a national shooting match. Additionally the study analyzed if any differences existed between participants flow and the constructs that make up flow as a result of participation in a national shooting match. Differences were also analyzed to determine if a person's age, shooter classification, and practice times of the shooters in the match. This is the first study that the author is aware of that examined competitive shooting and how the factors of age, shooter experience (classification), practice, and the caliber shot has on a person's flow experience.

The significant correlation finding in regards to age and the participant's global mean flow state score would suggest that, for this study's participants, as a person ages their ability to experience flow during an event increases. This significant correlation was confirmed by the ANOVA procedure and showed as the person increased in age their ability to experience flow in their activity increased. It is not apparent if this means the shooter would then experience a lower match score as that data was not collected in this study. Future studies should collect data on the participants total match score in order to determine the correlation between the participants flow score and total match score. If this correlation could be shown to be significant it would allow for some suggestions on techniques that shooters could utilize to improve their match scores.

Age additionally affected the shooters challenge-skill balance, action-awareness merging, and loss of self consciousness constructs of flow. Csikszentmihalyi (1990) suggests that each of these constructs is important factors that should be experienced positively in order for a person to experience flow to its fullest. The finding of this study would reinforce his theory on the importance of each of the constructs of the flow experience.

It is apparent from the study findings that as a shooter progresses in their classification status their ability to experience the flow constructs of challenge-skill balance and action-awareness merging is enhanced. The post hoc procedure, used to determine which groups vary significantly, demonstrated that there is a distinct difference between a master level shooter and novice and marksmanship level shooters. This could be a result of a couple different factors. First, the very nature of the amount of time a person must practice and put into advancing in the shooting classification may be a factor in a person's ability to enter flow or to have a peak experience. Secondly, it may be, however not always, a factor of the maturation (age) process of the shooter. Future research should use the participants total match score as a dependent variable and then use, age, sex, shooter classification, practice and other variables in a regression analysis in order to explain how much each accounts for the participants total match score.

The data would indicate that the amount of practice time an individual pursues affects the shooters ability to enhance the flow constructs of challenge-skill balance and loss of self-consciousness. It may be that individuals whom devote at least 6 hours of practice are working on the skills that allow them to acquire the next classification level. It would appear that in order to lose yourself in the activity and thus not worry about what others are thinking about you would depend on your experience practicing that scenario. Future research should focus on assessing the shooters use of imagery in their shooting matches. This then should be correlated

with flow and the constructs that make up flow in order to determine if any relationships exist between the two techniques.

Completing the recommendations on future research proposed by this study may provide a more thorough understanding about how an individual could use techniques in order to experience flow with the use of imagery and thus discover strategies to use in decreasing overall match scores/times.

For further reading about flow and research that has examined this phenomenon a list of references is provided. It should be noted that the list provided is not totally exhaustive. Suggestions for other studies and research that readers may be aware of are welcome by the author of this article.

References

Csikszentmihalyi, M. (1975). *Beyond boredom and anxiety*. San Francisco: Jossey-Bass.

Csikszentmihalyi, M. (1990). *Flow: the psychology of optimal experience*. New York: Harper & Row.

Flood, S., & Hellstedt, J. (1991). Gender differences in motivation for intercollegiate athletic participation. *Journal of Sport Behavior, 14*(3), 159.

Jackson, S.A. (1995). Factors influencing the occurrence of flow state in elite athletes. *Journal of Applied Sport Psychology, 7*(2), 138-166.

Jackson, S. A. (1993). Elite athletes in flow: The psychology of optimal sport experience. (Doctoral dissertation, University of North Carolina at Greensboro, 1992). Dissertation Abstracts International, 54,(1), 124-A.

Jackson, S.A., & Csikzentmihalyi, M. (1999). *Flow in sports: The keys to optimal experiences and performances*. Champaign, IL: Human Kinetics.

Jackson, S.A., & Eklund, R.C. (2004). *The flow scales manual*. Morgantown, WV: Fitness Information Technology, Inc.

Jackson, S.A., & Eklund, R.C. (2002). Assessing flow in physical activity: The Flow State Scale-2 and Dispositional Flow Scale-2. *Journal of Sport & Exercise Psychology, 24*(2) 133-150.

Jackson, S.A., & Marsh, H.W. (1996). Development and validation of a scale to measure optimal experience: The flow state scale. *Journal of Sport & Exercise Psychology, 18*(1), 17-35.

Jackson, S.A., Thomas, P.R., Marsh, H.W., & Smethurst, C.J. (2001). Relationships between flow, self-concept, psychological skills, and performance. *Journal of Applied Sport Psychology, 13,* 154-178.

Marsh, H.W., & Jackson, S.A. (1999). Flow experiences in sport: Construct validation of multidimensional hierarchical state and trait responses. *Structural Equation Modelling, 6,* 343-371.

Nocholls, R. A., Holt. L. N., & Polman. C.J. Remco. (2003). The effects of individualized Imagery interventions on golf performance and flow states. *The online Journal of Sport Psychology. 7*. Retrieved December 5, 2007, from http://www.athleticinsight.com/Vol1%20iss7/ImageryGlofFlow.htm http://www.athleticinsight.com/Vol1 iss7/ImageryGlofFlow.htm

Privette, G. (1984). *Experience questionnaire*. Pensacola, FL: The University of West.

Russell, W.D. (2001). An examniation of flow state occurrence in college athletes. *Journal of Sport Behavior, 24*(1), 83.

Takuya, S., & Inomata, K. (2005). Qualitative examination of flow experience among top Japanese athletes. *Perceptual and Motor Skills, 100*(3), 969-982.

William, D. R. (2001). An examination of flow state occurrence in college athletes. *Journal of Sport Behavior, 24*, 83-107.

Young, A. J., & Pain. D. P. (1999). The Zone: Evidence of a Universal Phenomenon for Athletes Across Sports. *The Online Journal of Sport Psychology, 1*. Retrieved December 9, 2007, from http://www.athleticinsight.com/Vol1iss3/Empirical_zone.htm