

Aikido Experience and its Relation to Mindfulness: A Two-Part Study¹

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Summary.—The martial art Aikido may be useful in the development of mindfulness. In this study, the authors examined the potential association of training in aikido may have on mindfulness. The sample of Study 1 comprised 159 participants completing two empirically validated scales of mindfulness and awareness, the Kentucky Inventory of Mindfulness Skills and the Mindfulness Attention Awareness Scale. Study 2 was a longitudinal study of 20 Aikido students from beginning through 5th Kyu (approximately 9 months of training). The results from both studies show significant increases in mindfulness scores with increased Aikido training.

The martial art Aikido is often referred to philosophically as a meditation in motion because of the heightened awareness that is ascribed to training (Dobson & Miller, 1978; Saotome, 1986, 1989). However, no relevant studies of Aikido and mindfulness were found in literature searches in EBSCOHost, ScienceDirect, or PsychINFO. Fuller (1988) argued that martial arts training, especially Aikido, has the potential for positive psychological effects. However, he also stated that there was very little empirical data on the benefits of martial arts training and that most published articles on martial arts training and well-being are based on theoretical perspectives. Since Aikido is considered to be a meditation-in-action, it is hypothesized that individuals with more experience in Aikido would report higher scores on empirically validated scales of mindfulness.

Meditation and related breathing exercises have been a historical part of Japanese martial art traditions. Samurai, dealing with life and death every day, embraced the meditation practices of Zen monks to help calm the mind and

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body. In turn, the Zen monks embraced the discipline and commitment that the Samurai dedicated to their training. The Budo arts developed as a result of the mixture of the Samurai training and monks' meditative practices (Stevens, 1993, 2002).

Aikido training involves basic body movements (Aiki Taiso) that are practiced at the beginning of each class. These movements help Aikido practitioners learn to be aware of the body through exercises in balance and breathing. Also during training, people practice movements with a partner (Tai Sabaki). As people practice the different paired movements they begin to develop an understanding of cooperation and timing in movement. To move successfully, the Aikido practitioner must coordinate with a partner in movement and timing. Aikido practitioners also receive instruction in basic techniques (Kihon Waza). The foundations for these basic techniques include learning how to safely and effectively throw, pin, and blend or adapt effectively with other people. Through such practices one's overall awareness increases: awareness of body position, awareness of others around the aikido practitioner, awareness of the practitioner's emotional states, as well as awareness of how other people's emotions may affect the aikido practitioner's emotional states (Shifflett, 1999; Westbrook & Ratti, 1970; Leonard, 1999).

Baer, Smith, Hopkins, Kreitemeyer, and Toney (2006) argued that mindfulness is a multifaceted construct, incorporating non-reactive observation and description as well as acting with awareness and without judgment. Mindfulness is considered by some a state of benevolent attention to all the content that arises in the mind (Kabat-Zinn, 1990; Shapiro, Carlson, Astin, & Freeman, 2006). While training in Aikido, people are taught to be mindful of the technique, breathing, balance, center of gravity, and their connection to the other person (Shioda, 1968, 1991; Ueshiba, 1984). Mindfulness is important to the practice of Aikido: if aikidoka (students of Aikido) are emotionally overwhelmed (i.e., with frustration), then the techniques may not be performed correctly; if an aikidoka were to act in such an emotional state, the techniques could result in injury to self or others.

Meditation (Shapiro, 1992) and stress reduction programs such as Kabt-Zinn's (1990) Mindfulness Based Stress Reduction has been used to teach people to become more mindful and aware of the present moment. Mindfulness has been used to treat anxiety, depression, chronic pain, and drug use (Kabat-Zinn, 1990; Shapiro, Carlson, Astin, & Freeman, 2006). Current literature also touts the

benefits of mindfulness practices on overall mental health (Didonna, 2008; Siegel, 2010; Stahl & Goldstein, 2010).

In this report, two studies of the associations of mindfulness and awareness in Aikido are presented.

Study One

Since stationary practices have been shown to improve awareness and mindfulness (i.e., seated meditation, mindful yoga, and body scan), it is of great interest and potential usefulness to assess whether active movement practices may improve these abilities as well.

Hypothesis 1. Aikido training will increase scores on a standardized mindfulness measure. Individuals with a Black Belt in Aikido will report significantly higher scores on mindfulness than a control group.

Hypothesis 2. Significant changes in mindfulness scores will be observed as practitioners progress from beginner to expert ranks.

Method

Participants

Participants were recruited via email and on-line from Aikido schools throughout the United States to participate in a Web-based assessment of mindfulness using questionnaires. An internet search for Aikido schools and on-line Aikido forums was done, and a link to the surveys was posted on the Aikido school's sites and Aikido group sites. A total of 159 participants (111 males, 48 females) consented to participate and completed the survey. Eighty-six were Kyu ranks (below black belt) (60 men, 26 women), 53 were Black Belts (47 men, 6 women) (Table 1).

Twenty control participants (4 men, 16 women) were recruited among students in a psychology course at the University of North Carolina at Wilmington. Students in an Introduction to Psychology course were asked if they would be willing to volunteer for a research study for extra credit. Control participants were awarded extra class credit for their participation. Controls were assessed for martial arts, yoga, and meditative experience through surveys. They had no experience in Aikido or other martial arts.

Measures

The Kentucky Inventory of Mindfulness Skills and the Mindfulness Attention Awareness Scale are both empirically validated measurement of mindfulness.

The Kentucky Inventory of Mindfulness Skills.— (KIMS; Baer, Smith, & Allen, 2004) measures mindfulness with 39 items. The 5-point response scale has anchors 1: Never or very rarely true and 5: Very often or always true. The KIMS includes statements about observing, describing, acting with awareness, and accepting without judgment (Baer, *et al.*, 2004). A sample statement from the KIMS is, "I pay attention to whether my muscles are tense or relaxed." Total scores may range from 39 to 195, with higher scores indicating greater mindfulness. Eighteen of the items on the KIMS are reverse scored. Internal consistency reliability was good with Cronbach's alpha reported at .87 (Baer, *et al.*, 2004).

The Mindfulness Attention Awareness Scale.— (MAAS; Brown & Ryan, 2003) measures consciousness associated with enhanced self-awareness. Participants respond to 15 statements on a 6-point scale, with anchors of 1: Almost always and 6: Almost never. An example statement is, "I find myself preoccupied with the future or the past". Total scores may range from 15 to 90; no items on the MAAS are reverse scored when totaling. With higher scores indicating greater self-awareness. Internal consistency reliability was good with Cronbach's alpha reported at .87 (Brown & Ryan, 2003).

Procedure

Survey.— The data were collected between November 2010 and March 2011. Participation was solicited via direct e-mail invitations to participate sent to members of Aikido dojos throughout the United States or through postings on-line Aikido forums. The e-mail or posting directed participants to a secure website in which they were able to read and offer consent and complete the surveys. The recruitment page of the website stated: "We are conducting research on how aikido training may affect people in their everyday lives. If you would please take a few minutes of your time to complete this survey, we would greatly appreciate it. Please answer each question based on your first feelings without thinking too long about the question. After you have finished please click submit only once. It will take about 30 seconds to finish. Thank you for your time! Please click on the link below to begin."

The KIMS (Baer, *et al.*, 2004) asks about other types of mindfulness type trainings (i.e. yoga, tai chi, other martial arts, meditation practices, etc). Participants who reported any type of mindfulness based training other than Aikido were excluded from the study ($n= 2$), to avoid any over lapping affects that yoga training or tai chi training might have on mindfulness.

Training. – As students move through Aikido training, they are tested for proficiency in understanding of technique before moving onto the next belt (rank). Participants were asked to report the Aikido rank that they currently held, which roughly corresponds to the number of years of Aikido training. The belt ranks are from beginning to advanced, from the lower ranks (Kyu) through black belt ranks (Dan); each rank is listed below with a minimum of time to earn the rank and the number of respondents who self-reported earning those ranks (Table 1).

Results and Discussion

The Kyu ranks were combined to assess mindfulness between participants who had achieved Black Belt and those that had not. One-way analysis of variance (ANOVA) on groups (Kyu, Black Belt, and Control) was conducted to compare the relationship of Aikido experience to KIMS scores between groups. A significant effect was found for Aikido experience on KIMS scores ($F_{2,156} = 23.97$, $p < .0001$, $\eta^2 = 0.31$). *Post hoc* comparisons using Tukey's HSD indicated that the Kyu group scored significantly higher than the Control group, and the Black Belt group scored significantly higher than both the Control group and the Kyu group (Table 2).

A similar one-way between groups ANOVA was conducted to assess the relationship of Aikido rank (Kyu, Black Belt, Control) and MAAS scores. There was a significant effect of group ($F_{2,156} = 29.28$, $p < .001$, $\eta^2 = 0.38$). *Post hoc* comparisons using Tukey's HSD indicated that the Kyu group's scores were significantly different than those of the Control group, and the Black Belt group scored significantly higher than both the other groups (Table 1).

Both hypotheses predicting a relationship between Aikido rank and mindfulness scores were supported.

Study Two

Since Study One was an internet survey, a replication with known participants was desirable. Study Two used a sample of local Aikido practitioners for a preliminary assessment of two hypotheses:

Hypothesis 1. Significant changes in self-report scores on mindfulness were expected with increased Aikido rank.

Hypothesis 2. Individuals in a control group would not show the same increases in mindfulness scores over the same period of time compared to Aikido practitioners.

Method

Participants

Beginning students, students with no prior martial arts experience, of the University of North Carolina Wilmington Aikido Club and the Kure Beach Aikido club were recruited for the study. Potential participants were asked if they would be willing to participate in a study exploring Aikido training and mindfulness. Twelve (3 women, 9 men) people volunteered as Aikido participants in the study. A control group of participants was recruited from a psychology course and was asked if they would be willing to volunteer for a study on mindfulness. Twenty (13 women, 7 men) people volunteered as control participants in the study.

Measures

The KIMS and MAAS were both used to assess measures of mindfulness for the longitudinal study. See Study One for details.

Procedures and Design

Aikido classes were offered four nights a week. Each training session lasted two hours. There was no randomization of assignment in this study, since all students were self-selected. Participants paid dues of \$25 per month to belong to the club and train. Participants were asked if they would be willing to volunteer for a study examining the effects of Aikido training and mindfulness after the third class that they attended. If the participant agreed, informed consents were given to them to sign. Participants were also given a copy of the informed consent to keep for themselves. The participants were asked to use code names that they could easily remember. To insure that all information remain confidential, surveys were kept in the principal investigator's office.

After informed consents were signed and returned to the principal investigator, mindfulness surveys were given to the participants to be filled out and returned during the next class to the principle investigator. Participants were assessed for mindfulness ratings using the Kentucky Inventory of Mindfulness (KIMS) (Baer, *et al.*, 2004) and Mindfulness Attention Awareness Scale (MAAS) (Brown & Ryan, 2003).

As Aikido students moved through their training they were required to display a certain proficiency in understanding of technique before moving onto the next belt rank. Measurements of mindfulness were conducted after a participant passed each belt test according to the Aikido World Alliance testing standards. The belt ranks were respectively: baseline (0 months training), 7th Kyu (2 months of training and 20 hours), 6th Kyu (3 months and 30 hours after

obtaining 7th Kyu), and 5th Kyu (4 months of training and 40 hours). The Control group participants were assessed on this same time line (baseline, then at 2 months, at 3 months and a final assessment 4 months later). The study took approximately 9 months to complete.

Results

A one-way repeated measures ANOVA was conducted to assess the effect of Aikido training on mindfulness scores on the KIMS and the MAAS by Kyu rank (baseline, 7th Kyu, 6th Kyu, 5th Kyu). There was a significant effect of Aikido training on mindfulness for the KIMS (Wilks Lambda = 20.38, $F_{1,3} = 20.38$, $p < .0001$, $\eta^2 = 0.68$) and also for the MAAS (Wilks Lambda = 7.71, $F_{1,3} = 7.71$, $p < .01$, $\eta^2 = 0.26$). *Post hoc t* tests were run between Aikido and Control groups on the KIMS scores at each testing time. There were statistically significant differences between the Control and Aikido groups at the 7th, 6th, and 5th Kyu ranks but not at baseline (Table 3). Likewise, *post hoc t* tests on MAAS scores indicated differences between groups at 7th, 6th, and 5th Kyu but not baseline (Table 3).

Discussion

The results of both of these studies suggest that Aikido training does have an effect on mindfulness scores. The results also suggest that training in Aikido may significantly increase mindfulness. Benefits of increased mindfulness may include better concentration, stronger awareness, improved immune system functioning and decreases in stress related physical symptoms (Shapiro, Carlson, Astin, & Freeman, 2006; Kabat-Zinn, 1994). Study One data showed significant differences in scores between control participants with no martial arts training and Aikido practitioners. There was also a significant difference between non-Black Belt (Kyu ranks) Aikido practitioners and Black Belt (Dan ranks) Aikido practitioners and a significant difference between controls and Black Belt Aikido practitioners. Study Two longitudinal data suggests that Aikido training may show increases in mindfulness scores over time among beginners (Kyu ranks).

The results of Study One suggest that continued, long term participation in Aikido training may be related to increasing mindfulness. We cannot conclude that this is a causal relationship. In Study Two, examination of baseline scores indicates that there was substantial self-selection of people with higher mindfulness scores into the Aikido training groups: on the KIMS, the baseline difference between groups' means was 9 points and the increase in mean scores

from baseline to 5th Kyu for the Aikido group was 7 points; on the MAAS, the baseline difference was 12 points and the increase for the Aikido group was only 5 points. However, the results are suggestive and encourage further research.

These findings are important for empirical, theoretical, and practical reasons. Empirically, these findings suggest that there may be benefits of training Aikido beyond physical fitness. Theoretically, Aikido training may enhance awareness and resolution of problem situations. Through Aikido training one learns to deal with multiple stressors concurrently. However, practitioners of Aikido learn to do it in an effective manner and while remaining calm (Fuller, 1988). It is not surprising that the results show a relationship between Aikido rank and higher reported scores on mindfulness: Aikido teaches practical problem solving and acceptance of circumstances.

Some future research factors include looking at longer longitudinal versus correlate factors when studying mindfulness and levels of aikido training, including assessing the mindfulness levels of individuals that may drop out of training. Other factors to be considered in future research might include examining the mechanisms through which aikido might increase levels of mindfulness.

It is acknowledged that there may be potentially inherent problems with survey style data collection; including honesty of participant, actual rank of participant and a possible selection bias. The authors assumed integrity and honesty while people answered the survey questions because there was no motivation for participant's deception on the surveys. Moreover, the martial art of Aikido is based in the Samurai tradition, which teaches respect and honor (Westbrook & Ratti, 1970).

This study is a first of its kind and other approaches have many different associated difficulties. For example, longer longitudinal studies will require great investments of time. Fuller (1998) stated that "The psychological profiles of expert martial artists with many years' experience are worthy of closer investigation to identify the most salient characteristics for research, but it is the short term effects upon novices which will be most germane to any evaluation of psychotherapeutic potential" (p. 327). These two studies support an empirically based argument that Aikido training may enhance mindfulness. The present results are only a first step in examining the effects that Aikido training may have, not only on mindfulness but also on overall well being. Hopefully, the results will encourage more empirical research on the martial arts and Aikido in particular.

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Table 1. Ranks, Approximate Timing of Rank Achievement by Standards, Number of Participants, and Self-reported Experience.

Rank	Number	Approx. Timing	<i>Experience, Yr:Mo.</i>
7 th kyu	20	2 mo. after starting	0:3
6 th kyu	11	3 mo. after 7 th kyu	0:6
5 th kyu	10	4 mo. training after 6 th kyu	0:11
4 th kyu	12	5 mo. training after 5 th kyu	1:4
3 rd kyu	10	6 mo. training after 4 th kyu	2:0
2 nd kyu	12	8 mo. after 3 rd kyu	2:8
1 st kyu	11	10 mo. after 2 nd kyu	3:8
Shodan	14	1 st degree black belt, 12 mo. after 1st kyu	4:8
Nidan	18	2 nd degree black belt, min. 24 mo. after Shodan	7:0
Sandan	13	3 rd degree black belt, min. 36 mo. after Nidan	11:0
Yondan	5	4 th degree black belt, min. 36 mo. after Sandan	15:0
Godan	2	5 th degree black belt, min. 5 yr. after Yondan	21:0
Rokudan	1	6 th degree black belt, min. 6 yr. after Godan	29:0

Note. – Experience estimated. * $p < .001$. ** $p < .005$. *** $p < .0001$.

Table 2. Study One: Descriptive Statistics and *Post Hoc* Comparison of Aikido Practitioner Groups at Kyu and Black Belt Ranks With Control Group (No Martial Arts Training) on KIMS and MAAS.

Mindfulness measure	Kyu (K)		Black Belt (B)		Control (C)		<i>Post hoc</i> comparison
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
KIMS	137.91	16.29	146.77	15.93	118.55	10.36	K>C***, B>K*, B>C***
MAAS	63.86	10.45	68.83	10.14	48.65	7.14	K>C***, B>K**, B>C***

Table 3. Study Two: Descriptive Statistics and *Post Hoc* Comparisons on Mindfulness (KIMS and MAAS) by Time of Testing (Rank Achievements in Aikido Group) Between Aikido and Control Groups

Time/rank	Aikido		Control		t_{30}	p	d
	M	SD	M	SD			
KIMS							
Baseline	135.00	15.79	126.00	9.79	-2.00	.06	0.13
7 th Kyu	135.00	16.00	123.00	8.71	-2.08	.01	0.26
6 th Kyu	145.00	13.68	121.00	9.10	-5.95	<.0001	1.18
5 th Kyu	142.00	13.08	121.00	13.69	-4.32	<.001	0.62
MAAS							
Baseline	67.00	31.47	56.00	10.69	-1.46	.15	0.07
7 th Kyu	70.00	29.94	54.00	9.19	-2.27	.03	0.17
6 th Kyu	76.00	26.75	53.00	9.52	-3.54	.001	0.42
5 th Kyu	72.00	18.46	52.00	9.23	-3.93	<.001	0.52