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Embodying martial arts for mental health: cultivating psychological well-being with martial arts practice

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Abstract

The question of what constitutes and facilitates mental health or psychological well-being has remained of great interest to martial artists and philosophers alike, and still endures to this day. Although important questions about well-being remain, it has recently been argued in the literature that a paradigmatic or prototypical case of human psychological well-being would characteristically consist of positive emotion, engagement, relationships, meaning, and accomplishment. Other scholarship has also recently suggested that martial arts practice may positively promote psychological well-being, although recent studies on martial arts have not yet been reviewed and integrated under the PERMA framework from positive psychology to further explore and explicate this possibility. This article therefore contributes to the literature by reviewing recent work on psychological well-being and martial arts to determine whether there is substantive support for the claim that practicing martial arts can positively contribute to one flourishing with greater psychological well-being.

Key words: meaning in life • personal accomplishment • positive psychology • social relationships

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Accomplishment - an element of psychological well-being that is concerned with competence, mastery, and achievements.

Emotion - nn element of psychological well-being that is concerned with positive feeling or affective valence.

Flow - an element of psychological well-being that is concerned with attentive absorption in an activity.

Meaning - an element of psychological well-being that is concerned with serving as a part of something larger than oneself.

Relationships - an element of psychological well-being that is concerned with human interpersonal interaction.

An Introduction to Martial Arts and Psychological Well-Being

The question of what constitutes and facilitates mental health or psychological well-being has remained of great interest to martial artists and philosophers alike [1-6], and still endures to this day.[1] Although important questions about the constitution and cultivation of psychological well-being remain, it has recently been argued in the literature that a paradigmatic or prototypical case of human psychological well-being would characteristically consist of "PERMA: positive emotion, engagement, relationships, meaning, and accomplishment" [3, 5, 6]. Consider for instance that in two studies recently published in *Increasing Psychological Well-Being in Clinical and Educational Settings*, Rashid et al. [7] drew upon this conceptual model of "Well-being and Resilience […] as the integration of positive emotions, engagement, positive relationships, meaning and accomplishment (PERMA)" to propose a new program of strength-based interventions for children and adolescents [7] while Noble and McGrath [8] similarly drew upon the PERMA model to propose a new program of positive education aimed at helping students develop their "Social and emotional competencies", including "Positive emotions", "Positive relationships", "Positive purpose", and "Optimal learning environments that facilitate achievement" [8, 9-11]. So given the application of the PERMA model to other areas of research in clinical and educational settings, this approach of investigating psychological well-being by investigating its common characteristics of positive emotions, engagement, relationships, meaning, and accomplishments is plausibly also useful to

1. For Sifu, Master Charles Robert, with much gratitude.

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adopt for the purpose of investigating whether martial arts practice and participation can contribute to one flourishing with greater psychological well-being.

The martial arts are commonly characterized as "structured fighting systems" that consist of individual and partner routines (i.e. *forms* or *kata*) as well as more freestyle fights with or without the use of external weapons [12, 13]. A study by Clearing House [14] reported that martial arts were among the top 10 most practiced sports across 26 European countries and Shahar [15] suggested that the reason why martial arts have appealed to millions of people in the West is because of their "unique synthesis of military, therapeutic, and religious goals" [15]. Woodward [16] further proposed that "Martial arts provide health-promoting and meaningful exercise for millions of practitioners" which include "better overall health and balance, as well as an improved sense of psychological well being" [16]. So since recent studies from the literature on martial arts offer empirical support for its effectiveness in promoting psychological well-being or mental health, the proposal here that martial arts practice and participation can positively contribute to one flourishing with greater psychological well-being is surely a plausible one worth further investigating. Yet recent studies from the literature on martial arts have not yet been reviewed and integrated under the PERMA framework from positive psychology to further explore and explicate the possibility that practicing martial arts can positively contribute to one flourishing with greater psychological well-being. This article therefore contributes to the extant literature on the psychology of martial arts and well-being by reviewing the recent literature to offer support for the claim that practicing martial arts can positively contribute to one flourishing with greater psychological well-being by positively influencing emotions, engagement, relationships, meaning, and accomplishment.

In order to appropriately begin the investigation of whether practicing martial arts can positively contribute to one flourishing with greater psychological well-being, the next section (The Influence of Martial Arts on Positive Emotions) will first review the recent literature on martial arts and positive emotion to further clarify how martial arts can function as a useful means for positively influencing the emotions, and in so doing, positively influencing the first characteristic component of psychological well-being (the PERMA factor P for positive emotion).

The Influence of Martial Arts on Positive Emotions

In "Flourish", Seligman [3] maintained that psychological well-being characteristically consists of positive emotion, engagement, relationships, meaning, and accomplishment [3, 5] and so the first characteristic component of well-being to be considered here is positive emotions. Fredrickson [17] for one proposed that "pleasant affective states appear to be critical ingredients within the recipe for human flourishing" [17] and so prior work in the psychological literature has considered positive emotions to be an important characteristic component of psychological well-being. In "Building a Neuroscience of Pleasure and Well-Being", Berridge and Kringelbach [18] explained that well-being characteristically consists of "at least two crucial ingredients: positive affect or pleasure (hedonia) and a sense of meaningfulness or engagement in life (eudaimonia)" [18] and accordingly suggested that "happiness springs not from any single component but from the interplay of higher pleasures, positive appraisals of life meaning and social connectedness, all combined and merged by interaction between the brain's default networks and pleasure networks" [18].[2] In research on the relationship between affective priming and life satisfaction in participants (n = 198), Robinson and Von Hippel [19] proposed that "the memory organization of positive and negative thoughts influences life satisfaction", since they found that the participants low in life satisfaction showed relatively larger negative (compared to positive) affective priming effects whereas the participants high in life satisfaction showed relatively larger positive (compared to negative) affective priming effects [19]. In other research on the relationship between subjective evaluations of positive affect, negative affect, and life satisfaction in participants (n = 438), Busseri, Choma, and Sadava [20] found that higher levels of subjective well-being were associated with greater positive psychological, physical, and interpersonal functioning. Further, in "The Role of Passion in Sustainable Psychological Well-Being", Vallerand [21] makes the important point that during engagement in an activity that takes place on a regular and repeated basis, one begins to cultivate positive emotions and "passion [that] contributes to sustained psychological well-being while preventing the experience of negative affect, psychological conflict, and ill-being" [21, 22]. By reviewing research of this kind

2. Berridge and Kringelbach [18] have even proposed that "eudaimonic wellbeing" may differentially correlate with functional activity in the anterior cingulate and in left prefrontal cortex whereas "hedonic wellbeing" may differentially correlate with functional activity in the subgenual cingulate and orbitofrontal cortices.

it becomes increasingly evident that studies do in fact suggest that positive emotions are an important characteristic component of psychological well-being.

Importantly, since positive emotions can contribute to psychological well-being, practicing martial arts can contribute to psychological well-being also since practicing martial arts can contribute to positive emotions. And several studies have in fact suggested that practicing martial arts can contribute to positive emotions. For example, in "Alterations in Selected Measures of Mood with a Single Bout of Dynamic Taekwondo Exercise in College-Age Students", Toskovic [23] investigated the influence of taekwondo practice on an inventory of psychological dimensions in participants (n = 20) and found that those participating in martial arts experienced significant improvements compared to controls on scores evaluating "Tension, Depression, Anger, Fatigue, Confusion, and Vigor", and that their involvement in this dynamic martial arts practice "achieves the necessary activity parameters that begin to induce positive mood state changes" [23]. In another study, Ziaee et al. [24] evaluated the level of anger in participants involved in judo (n = 70), karate (n = 66), swimming (n = 59), and no athletic activity (n = 96) and reported finding that those participating in karate practice experience significantly lower scores on instrumental anger and higher scores on anger control compared to non-athletes, and that "a significant lower total anger score was found in karateka than non-athletes" [24]. Bodin and Martinsen [25] also investigated whether self-efficacy mediated the antidepressant effects of physical activity on participants (n = 12) diagnosed with clinical depression and reported finding that "During martial arts, statistically significant increases in positive affect, reductions in negative affect and state anxiety, and increased self-efficacy were observed" [25]. Further, in another study investigating the association in participants (n = 276) between their habitual physical activity and their experience of positive and negative affect, Pasco et al. [26] reported finding that "higher positive affect scores, encompassing emotions such as interest, excitement, enthusiasm and alertness, are associated with higher levels of habitual physical activity" [26]. So given the fact that martial arts practice is clearly a physical activity, it can thereby sensibly afford the engaged participant as a reliable source of positive affect. Resultantly, since positive emotions can contribute to psychological well-being [3, 5, 17-22], and since several studies have indeed suggested that practicing martial arts can contribute to positive emotions [23-26], there are good grounds for maintaining that practicing martial arts can positively contribute to psychological well-being.

This section has now reviewed the recent literature on martial arts and positive emotion to further clarify how martial arts can function as a useful means for positively influencing emotions. In order to further continue the investigation of whether practicing martial arts can positively contribute to one flourishing with greater psychological well-being, the next section (The Influence of Martial Arts on Engagement) will proceed to review the recent literature on martial arts and engagement (or "flow" experiences) to further clarify how martial arts can function as a useful means for positively influencing engagement, and in so doing, positively influencing the second characteristic component of psychological well-being (the PERMA factor E for engagement).

The Influence of Martial Arts on Engagement

Given that psychological well-being is considered to characteristically consist of positive emotion, engagement, relationships, meaning, and accomplishment, the second characteristic component of well-being to be considered here is engagement or flow experience [3, 5]. The "engaged life", Seligman [5] maintains, "is about flow: being one with the music, time stopping, and the loss of self-consciousness during an absorbing activity" [5] and Rich [27] similarly maintains that "a good life is one characterized by complete absorption in what one does", and that "A life worth living then, seems to involve flow" [27, 28]. So prior work in the psychological literature has considered engagement or flow experience to be an important characteristic component of psychological well-being. In the literature "flow" experience has been characterized as a "state of optimal experience that people report when they are intensely involved in doing something that is fun to do" [29], as "the experience of complete absorption in the present moment" [30], and as "a state of mind characterized by focused concentration and elevated enjoyment during intrinsically interesting activities" [31]. Flow experiences have been considered to characteristically occur under conditions of "perceived challenges, or opportunities for action, that stretch (neither overmatching nor underutilizing) existing skills; a sense that one is engaging challenges at a level appropriate to one's capacities", or conditions of "Clear proximal goals and immediate feedback about the progress that

is being made" [28]. Several characteristic features of flow experience include "Intense and focused concentration on what one is doing in the present moment", the "Merging of action and awareness", the "Loss of reflective self-consciousness (i.e. loss of awareness of oneself as a social actor)", "A sense that one can control one's actions; that is, a sense that one can in principle deal with the situation because one knows how to respond to whatever happens next", a "Distortion of temporal experience (typically, a sense that time has passed faster than normal)", and "Experience of the activity as intrinsically rewarding, such that often the end goal is just an excuse for the process" [28, 32-38]. In "Absorption as a Therapeutic Agent", Hymer [39] suggested that this kind of absorbed focus and "immersion in an object" leads to "the temporary loss of self" and "eventuates in self-enhancement" [39] and in a more recent study investigating the relationship between subjective flow reports and psychophysiological measures in piano playing participants (n = 21), De Manzano et al. [40] reported finding that flow experience arise through an interaction between high attention and positive affect [40] and that increased flow is related to decreased heart period and respiratory sinus arrhythmia, as well as to increased LF/HF ratio, total power, and respiratory depth [40]. As De Manzano et al. [40] conclude, this "suggests that during a physically and cognitively demanding task, an increased activation of the sympathetic branch of the autonomic nervous system in combination with deep breathing and activation of the ZM [zygomaticus major] might potentially be used as an indicator of effortless attention and flow" [40].

Dietrich [41] further explained in "Neurocognitive Mechanisms Underlying the Experience of Flow", that human psychological information processing involves cognitive systems for processing both explicit reason-based knowledge (which primarily implicates the frontal lobe and medial temporal lobe) as well as implicit skill-based knowledge (which primarily implicates the basal ganglia), and that what is unique about flow experience is that it involves a state of "transient hypofrontality" that enables "the temporary suppression of the analytical and meta-conscious capacities of the explicit system" [41]. Importantly, Dietrich [41] also mentioned the "sensory-motor integration skills that seem to typify flow" since the previously relevant learning or training by an agent of "a highly practiced skill" – such as the skill of performing an exemplary execution of *forms* or *kata* during martial arts practice, which can only be performed by a martial artist once they have endured repeated rehearsal and acquired the requisite bodily sedimentation of know-how – is presumably a prerequisite for the relevant flow experiences of that agent since this cultivated kinesthetic skill of the martial artist is taken to be incorporated into their implicit system's knowledge base and "implemented without interference from the explicit system" during flow experience [41]. In fact, this proposal is consistent with results from other recent research conducted by Schlaffke et al. [42] that found that participants practicing martial arts (n =13) showed changes in regional brain morphology in areas implicated in motor learning and planning, including higher gray matter (GM) volumes in the supplementary motor area/dorsal premotor cortex (BA 6) [42].

In other words, in order for a cultivated and embodied kinesthetic skill, such as the skill of performing an exemplary execution of *forms* or *kata* during martial arts practice, to become incorporated into the implicit system of the knowledge base of a martial artist, and thus capable of being implemented by that martial artist without interference from their explicit system during occasions of flow experience, a sufficient amount of relevantly cultivated kinesthetic skill must first be acquired by that martial artist through a substantive (though not excessive) amount of deliberate martial arts practice and the accumulation of the relevant sensory-motor integration that it results in [41, 42]. So regardless of the particular style of martial arts practice that one adopts, the practice of becoming an exceptionally fine-tuned martial artist typically involves a commitment to chiseling oneself into perfection with repeatedly relevant behavioral practice and focused attention, or as the influential martial artist Nagamine Shoshin (10th Dan in Karate) had said, "Only through the relentless study of karate-do can one achieve the highest standards of inner beauty and strength" and that "The fusing of the body and mind through karate-do is indescribably beautiful and spiritual" [43]. Strati, Shernoff, and Kackar [31] argue that "Because flow states are enjoyable, they motivate individuals to continue developing skills and raising challenges to reenter flow", and that because flow experiences provide students with "an orientation of engagement and skill-building that carries into the future", flow experiences are valuable for learning and development [31]. As Strati, Shernoff, and Kackar [31] argue "Flow experiences thereby enhance the quality of life, add to the complexity of the developing self, and facilitate talent development in youth" [31] and Nakamura and Csikszentmihalyi [30] have similarly proposed that "experiencing flow

encourages a person to persist in and return to an activity because of the experiential rewards it premises, and thereby fosters the growth of skills over time" [30] and that "Because the self grows through flow experiences, we also might expect time spent in flow to predict self-esteem" [30]. By reviewing research of this kind it becomes increasingly evident that studies do in fact suggest that engagement or flow experiences is an important characteristic component of psychological well-being.

Importantly, since engagement or flow experience can contribute to psychological well-being, practicing martial arts can contribute to psychological well-being also since practicing martial arts can contribute to engagement or flow experience. The influential martial artist Kenwa Mabuni (founder of Shito-Ryu Karate) for instance maintained that "When the spirit of karate-do is *deeply* embraced, *it becomes the vehicle* by which *one is ferried across the great void to enlightenment*" [43] and the influential martial artist Nagamine Shoshin (10th Dan in Karate) similarly stated that "When totally *absorbed* in *kata*, *one is brought into complete contact with the central core of one's being*" and that "It is there that the essence of karate-do is to be discovered" [43]. And interestingly enough, several studies have in fact suggested that practicing martial arts can contribute to engagement or flow experience. For example, in "Spontaneity in Western Martial Arts", Keenan [44] explained how "The spontaneity of a kendo practitioner comes indeed from the mind of no-mind, from his or her ability to act from the body, and not to have to process reactions through the [discursive] mind" [44] and similarly, Iwasaki [45] more recently explained that, in a manner "somewhat analogous to the western concept of "flow" [36], "Jing Jie" is considered the highest pursuit of leisure for many Chinese people, which can be experienced through the harmony with nature and through creative or martial arts" [45-48]. As Csikszentmihalyi [36] has also informatively discussed in *Flow: The Psychology of Optimal Experience*:

> Instead of focusing exclusively on physical performance, as Western martial arts do, the Eastern variety is directed toward improving the mental and spiritual state of the practitioner. The warrior strives to reach the point where he can act with lightning speed against opponents, without having to [explicitly] think or reason about the best defensive or offensive moves to make. Those who can perform it well claim that fighting becomes a joyous artistic performance, during which the everyday experience of duality between mind and body is transformed into *a harmonious one-pointedness of mind*. Here again, it seems appropriate to think of *the martial arts as a specific form of flow*. [36]

Also, in "On the Mental Preparation Process for Competition", the eight-time US National Champion and world medalist in traditional Karate, Soolmaz Abooali [49], offered the following relevant insight:

> The most common error is to focus on too many things. A scene in the movie *The Last Samurai* dubbed this concept "too many minds" and labeled it the antithesis of success. This is correct. The key to performing at your best in any situation, particularly high pressure ones, is to relax and exhale any negative and positive thoughts – simply let them flow out without affecting you. This way, your body and spirit remain undisturbed, enabling you to *maintain mental focus and follow through on what you've diligently practiced*. *You will be freer to perceive and react as necessary*. [49]

Faggianelli and Lukoff [50] further investigated the experiences of participants (n = 8) that were involved in the practice of aikido and explained how one of the participants (Tim) responded by reporting that "Aikido practice promotes *listening*, *a quality of aliveness*; it's the opposite of being in a hypnotic trance" [50] and Schuler [51] even argued that "Flow experience is not just a hedonic feeling that enhances an individual's quality of life; it is also an optimal functional state that can lead to peak performance in sports or music and can be a matter of life and death in life-threatening situations. From an evolutionary point of view, flow has a high adaptive value" [51]. After all, it seems reasonable that having an exceptional ability, not only for *self-defense* but also for *self-regulation*, thanks to the embodied kinesthetic skill that martial arts practice affords would serve one well throughout their life. Resultantly, since engagement or flow can contribute to psychological well-being [3, 5, 27-36, 38-41, 52, 53], and since several studies have indeed suggested that practicing martial arts can contribute to engagement or flow experience [36, 43-51], there are good grounds for maintaining that practicing martial arts can positively contribute to psychological well-being.

This section has now reviewed the recent literature on martial arts and engagement or flow experiences to further clarify how martial arts can function as

a useful means for positively influencing engagement or flow experiences. In order to further continue the investigation of whether practicing martial arts can positively contribute to one flourishing with greater psychological well-being, the next section (The Influence of Martial Arts on Relationships) will proceed to review the recent literature on martial arts and relationships to further clarify how martial arts can function as a useful means for positively influencing relationships, and in so doing, positively influencing the third characteristic component of psychological well-being (the PERMA factor R for relationships).

The Influence of Martial Arts on Relationships

Given that psychological well-being is considered to characteristically consist of positive emotion, engagement, relationships, meaning, and accomplishment, the third characteristic component of well-being to be considered here is (positive) relationships [3-5]. In a philosophical analysis focusing on Aristotle and friendship, for instance, Cooper [54] suggested that "we value, and are right to value, friendship so highly because it is only in and through intimate friendship that we can come to know ourselves and to regard our lives constantly as worth living" [4, 54, 55] so prior work in the literature has considered interpersonal relationships to be an important characteristic component of psychological well-being. For example, Hicks and King [56] reported finding in a study of participants (n = 150) that individuals with strong social bonds judged their meaning in life to be high regardless of mood, and accordingly, that "Social relationships are clearly an important contributor to meaning in life" [56, 57]. Baumeister and Leary [58] also reviewed the empirical literature to investigate whether people need to form and maintain stable interpersonal relationships, and reported that "Existing evidence supports the hypothesis that the need to belong is a powerful, fundamental, and extremely pervasive motivation" and that "Lack of attachments is linked to a variety of ill effects on health, adjustment, and well-being" [58]. In other recent research, Noble and McGrath [59] have further discussed how social skills that enhance cooperation and underpin positive relationships appear to be especially important for resilience and wellbeing, Berridge and Kringelbach [18] have pointed out that social pleasures are often considered to be as pleasurable as the basic sensory pleasures [18, p. 4], and Roffey [60] writes that "We often experience positive feelings in interactions with friends that boost our resilience, confidence and a positive sense of self" so that "Friendship is therefore critical for our psychological health" [60-64]. By reviewing research of this kind it becomes increasingly evident that studies do in fact suggest that positive relationships are an important characteristic component of psychological well-being.

Importantly, since positive relationships can contribute to psychological well-being, practicing martial arts can contribute to psychological well-being also since practicing martial arts can contribute to positive relationships. And several studies have in fact suggested that practicing martial arts can contribute to positive relationships. For example, in a study investigating the factors that motivated participants (n = 75) to engage in martial arts practice, Jones, Mackay, and Peters [65] reported finding that the four most important motivations for martial arts participation were "'Affiliation', 'Fitness', 'Skill Development' and 'Friendship'" [65], and in another study investigating the influence of martial arts for couples (n = 9) and families (n = 23) that had been practicing (i.e. aikido, karate or taekwondo) for at least four months, Lantz [66] reported that "The couples and families consistently reported that martial arts study facilitates marital and family development, and offered 12 basic themes about how this facilitation occurs", including "self-defense, self-confidence, physical vitality, concentration, respect, friendship, moral development, spirit, training for life, grades, respect for life, and the importance of the martial arts instructor", which "suggests that marital and family therapists should be more active in asking their clients to consider a referral for martial arts instruction as a useful complementary activity along with participation in marital and/or family therapy" [66]. In other relevant research, Zivin et al. [67] investigated whether student (n = 60) participation in martial arts at school would influence their level of confrontational behavior and reported finding that "juveniles at high risk for violence and delinquency showed decreased violence and positive changes in psychological risk factors after being required to take a school-linked course in traditional martial arts" and "improved significantly in the areas of resistance to rules, impulsiveness, and inappropriate social behavior", as well as on "self-reported happiness and schoolwork and on one measure of attention" [67]. Daniels and Thornton [68] also investigated the relationship between martial arts practice and hostility in participants (n = 40) and reported finding that "increased training in the martial arts is associated with low scores on the assaultive and verbal hostility scales of the Buss-Durkee Hostility Inventory", that "this effect may be

peculiar to the martial arts", and that "the association between martial arts and low levels of hostility increases in strength with the number of years spent practicing the martial arts, which supports previous research" [68]. Daniels and Thornton [68] therefore concluded that "Increased martial arts training may serve to decrease assaultive hostility" [68]. Similarly, Twemlow et al. [69] investigated whether the "Gentle Warrior" martial arts-based intervention could be used to reduce aggression in children (n = 254) and found that "boys who participated in more Gentle Warrior sessions reported a lower frequency of aggression and greater frequency of helpful bystanding (i.e., helpful behavior toward victims of bullying) over time, relative to boys with less frequent participation", that "The effect of participation on aggression was partially mediated by empathy", and that "Results of the study provide preliminary support for the use of martial arts-based interventions to address bullying in schools for boys, by teaching empathy, self-control, and peaceful strategies to resolve conflicts" [69]. Finally, in an interesting study investigating the effects of long-term martial arts practice of *form* or *kata* techniques on the social interaction of children (n = 15) with autism spectrum disorders, Movahedi et al. [70] reported finding that "After receiving Kata-based treatment, the participants of the exercise group demonstrated a substantial improvement in social interaction", that "social dysfunction decreased from baseline levels by a M of 40.32% across participants", and that even "after 30 days of no practice, social dysfunction in the exercise group remained significantly decreased compared to post-intervention time" whereas "The participants of the control group revealed no change in their social dysfunction score across the experimental period" [70]. Resultantly, since positive relationships can contribute to psychological well-being [3-5, 18, 54-64], and since several studies have indeed suggested that practicing martial arts can contribute to positive relationships [65-70], there are good grounds for maintaining that practicing martial arts can positively contribute to psychological well-being.

This section has now reviewed the recent literature on martial arts and relationships to further clarify how martial arts can function as a useful means for positively influencing relationships. In order to further continue the investigation of whether practicing martial arts can positively contribute to one flourishing with greater psychological well-being, the next section (The Influence of Martial Arts on Meaning) will proceed to review the recent literature on martial arts and the sense meaning or purpose in life to further clarify how martial arts can function as a useful means for positively influencing the sense of meaning or purpose in life, and in so doing, positively influencing the fourth characteristic component of psychological well-being (the PERMA factor M for meaning).

The Influence of Martial Arts on Meaning

Given that psychological well-being is considered to characteristically consist of positive emotion, engagement, relationships, meaning, and accomplishment, the fourth characteristic component of well-being to be considered here is meaning [1-2]. De Muijnck [71] for one has recently suggested that "Experiencing life as meaningful seems to be a major component of human well-being, and a major source of motivation for human action" [71] so prior work in the psychological literature has considered having meaning or purpose in life to be an important characteristic component of psychological well-being. For example, in a study on what people find important for a meaningful life, Crescioni and Baumeister [72] reported that "When individuals talk of finding meaning in their lives […] they seek to interpret their own actions and experiences in terms of an existentially meaningful life story" that "depict actions and decisions as following from important, stable values and contributing to the fulfillment of one or more crucial goals" [72]. In another study investigating whether positive factors (including purpose in life, reasons for living, and coping styles) mediated the relationship between stressful life events and suicidal behaviors among participants (n = 416) in college, Wang et al. [73] reported finding that "Both purpose in life and reasons for living had inverse effects on depression, the higher the purpose in life and reasons for living, the lower the depression, and the lower the relationship between depression and suicidal ideation/behavior", and that accordingly, "Purpose in life and reasons for living were found to be important predictors of suicide and may reduce the likelihood of suicidal thoughts and behaviors" [73]. In other recent work, Bronk et al. [74] investigated the relationship among purpose, hope, and life satisfaction among participants (n = 806) and found that identifying a purpose in life is associated with greater life satisfaction across adolescence, emerging adulthood, and adulthood [74], Chamberlain and Zika [75] investigated religiosity as a predictor of meaning in life in a sample of participants (n = 188) and found that the relationship between life satisfaction

and religiosity is mediated by meaningfulness, and Byron and Miller-Perrin [76] investigated the relationship between faith, life purpose, and well-being in participants (n =103) and found that "life purpose completely mediated the relationship between faith and well-being", which suggests that "the impact of faith on well-being can be explained by life purpose" [76]. In another study investigating the presence of meaning in life, and the search for meaning, within four life stage groups (emerging adulthood, young adulthood, middle-age adulthood, and older adulthood) from a sample of participants (n = 8, 756) on the internet, Steger, Oishi, and Kashdan [77] reported finding that, "not only do most people report that they are more likely to feel their lives are meaningful than not, but the more meaning in life people reported, the greater well-being they experienced, at all life stages" [77]. By reviewing research of this kind it becomes increasingly evident that studies do in fact suggest that having a sense of meaning or purpose in life is an important characteristic component of psychological well-being.

Importantly, since meaning can contribute to psychological well-being, practicing martial arts can contribute to psychological well-being also since practicing martial arts can contribute to meaning. And several studies have in fact suggested that practicing martial arts can contribute to meaning. As the philosopher and martial artist Kevin Krein [78] explained in his contribution to *Martial Arts and Philosophy*, "my martial-arts training has played a key role in my conception of who I am, what my goals are, and what I expect to accomplish. This is also true for many of those I train with […] people like us find the study of martial arts so rewarding, and meaningful". As Krein [78] further explained, the "Traditional martial arts, such as Karate, provide a framework for living a meaningful life", and consequently, "The study of martial art can be a very valuable addition to the lives of people who are concerned about living a meaningful life" [78]. Indeed, in another study investigating the experiences of participants (n = 8) that practiced aikido, Faggianelli and Lukoff [50] explained how one of the participants (Robert) reported that:

> [Martial arts] practice is a practice to learn a certain state of being. Aikido is no longer what you do on the mat, Aikido is what you do. In Aikido you have some crazy attacker coming at you, and your goal is to be relaxed and centered and calm and able to absorb and join with, just be there with that energy, in a way that can accept and redirect it. A lot of what you do in therapy is the same thing – just be there and not be overwhelmed by what's going on, and that has a very calming effect [50].

In "Kime and the Moving Body: Somatic Codes in Japanese Martial Arts", Cohen [79] further illustrated how a martial artist's commitment to continued martial arts practice, and the concomitant incorporation of accumulated martial arts skill that this typically results in, can influence their identity and readiness-to-act in the world. According to Cohen:

> *Learning karate means discovering it inside one's own moving body*. *Certain modes of movement are conditions for achievement and for intentionality in the martial art's world-of-meaning*. Having acquired those capacities of movement, the *karateka* can design the *karate* training, and also his/her own body, to suit the goals, in that way *embodying karate*. Only a *karateka* who is proficient in the use of *kime* and other *somatic abilities developed through training*, can be active and successful in the world of *karate*. Moreover, the significance of using *kime* goes beyond its practical value in combat; the very essence of *karate* training, of *its interactive sociality*, is to develop *kime*, as *the revelation of potentialities hidden within* is the essence of karate. [79, 53]

Indeed, in other research investigating the influence of martial arts training on the self identity of female participants (n = 30) that practiced seido karate, Guthrie [80] reported finding that "women's self concept is profoundly altered when physically empowering activities such as the martial arts are practiced" and that "healing from incest, rape and other forms of violence is facilitated by martial arts/self defense training" [80]. In another study investigating the significance of leisure for female participants (n = 48) with depression, Fullagar [81] also reported finding that "Women talked about how they engaged in leisure "for" themselves (e.g. alone or with others) to deal with multiple pressures and to experience a different sense of self" and that eight female participants specifically mentioned "walking outdoors and martial arts (e.g., tai chi, tai kwon do, karate)" as the leisure activities they practiced for the purpose of recovering from depression. As Fullagar [81] explained, "Leisure figured as a site of identity transformation where women enacted creative, embodied, and connected subjectivities" and that "The recovery practices adopted by [these] women were significant not because of the "activities" themselves but in terms of the *meanings* they attributed to

their *emerging identities*". Resultantly, since meaning can contribute to psychological well-being [3, 5, 71-74, 76, 77], and since several studies have indeed suggested that practicing martial arts can contribute to meaning [50, 78-81], there are good grounds for maintaining that practicing martial arts can positively contribute to psychological well-being.

This section has now reviewed the recent literature on martial arts and meaning to further clarify how martial arts can function as a useful means for positively influencing the sense of meaning or purpose in life. In order to further continue the investigation of whether practicing martial arts can positively contribute to one flourishing with greater psychological well-being, the next section (The Influence of Martial Arts on Accomplishment) will proceed to review the recent literature on martial arts and personal accomplishments to further clarify how martial arts can function as a useful means for positively influencing personal accomplishments, and in so doing, positively influencing the fifth and final characteristic component of psychological well-being (the PERMA factor A for accomplishment).

The Influence of Martial Arts on Accomplishment

Given that psychological well-being is considered to characteristically consist of positive emotion, engagement, relationships, meaning, and accomplishment, the fifth and final characteristic component of well-being to be considered here is accomplishment [3-5]. Seligman [3] considered accomplishment to be an important characteristic component of psychological well-being since "Many people are motivated to achieve, to have mastery, to have competence, even if it brings no positive emotion, no engagement, no relationships, and no meaning". In "Achievement and the Meaningfulness of Life", James [82] similarly argued that, "All other things being equal, a life with some achievements in it is more meaningful than one without any achievements" [82]. So prior work in the psychological literature has considered accomplishments to be an important characteristic component of psychological well-being. Kaplan and Maehr [83] for one investigated the role that achievement goals play in facilitating the psychological well-being of students (n = 168) and reported that "Pursuing task goals was found to have a significant positive relationship with all indices of well-being, as well as with perceptions of academic efficacy and GPA". Avey et al. [84] also conducted a meta-analysis that included 51 independent samples (n = 12, 567 employees) for the positive core construct of Psychological Capital (PsyCap) – which consists of "the psychological resources of hope, efficacy, resilience, and optimism" – and reported that PsyCap "is significantly and strongly related to employee attitudes generally considered desirable by human resource management", including "job satisfaction, organizational commitment, and psychological well-being at work" and "is negatively related to attitudes considered undesirable, such as employee cynicism, turnover intentions, and employee stress and anxiety" [84]. Avey et al. [84] further reported that "employees' PsyCap [which includes hope, efficacy, resilience, and optimism] was positively related to their generally recognized desirable behaviors, such as organizational citizenship behaviors, and negatively related to their undesirable behaviors, such as deviance". And in another study, Hassanzadeh and Mahdinejad [85] investigated the relationship between happiness and achievement motivation among graduate students (n = 50) by having them take the Oxford Happiness Questionnaire (OHQ) and Achievement Motivation Questionnaire (AMQ) and reported finding that there was "a significant relationship between happiness and achievement motivation" [85]. By reviewing research of this kind it becomes increasingly evident that studies do in fact suggest that accomplishments are an important characteristic component of psychological well-being.

Importantly, since accomplishments can contribute to psychological well-being, practicing martial arts can contribute to psychological well-being also since practicing martial arts can contribute to accomplishments. And several studies have in fact suggested that practicing martial arts can contribute to accomplishments. As the philosopher and martial artist Kevin Krein [78] explained in his contribution to *Martial Arts and Philosophy*:

> Martial arts provide a lifetime of opportunities for self-improvement. The study of a traditional martial art provides a framework in which to situate one's continual development as a human being. The emphasis on striving for perfection of both mind and body make the dojo an ideal place to continue to recreate ourselves by going beyond our current understanding and abilities [78].

In a review of the literature on martial arts practice, Twemlow and Sacco [86] further illustrated how a martial artist's commitment to martial arts practice, and the consequent conditions for training and testing that this often results in, may come to influence that martial artist's sense of accomplishment. As Twemlow and Sacco [86] illustrate the point:

> Rankings within the martial arts offer students concrete status and recognition. Unlike many dysfunctional homes, the training program provides consistent, positive reinforcement for altruistic and focused behavior. Out-of-control behavior is quickly discouraged and, more importantly, acceptable behaviors are clearly presented and easy to follow. Belt testing, patches, and special rewards, combined with an encouraging milieu, provide an antidote to negative family, community, and school experiences [86].

In other relevant research, Ko, Kim, and Valacich [87] investigated the motivational factors that influenced participants (n = 307) to practice martial arts and reported finding that the participants were "attracted by personal growth opportunities offered in martial arts training", and that "Other than cultural learning, all growth-related factor means were high (i.e. achievement, self-esteem and value development). In other words, martial arts practitioners perceive that personal improvement is the most important benefit of martial arts training". Resultantly, since accomplishment can contribute to psychological well-being [3, 5, 82-85], and since several studies have indeed suggested that practicing martial arts can contribute to accomplishment [78, 86, 87], there are good grounds for maintaining that practicing martial arts can positively contribute to psychological well-being.

Conclusion

Although the question of what constitutes human flourishing or psychological well-being has long remained a hot topic of debate among scholars since at least the time of Aristotle [4], it has recently been argued in the literature that a paradigmatic or prototypical case of human psychological well-being would largely manifest most or all of the five characteristic components discussed in this article, including positive emotion, engagement, relationships, meaning, and accomplishment [3, 5, 6]. Prior work by scholars such as Woodward [16] also suggested that the martial arts offer health-promoting and meaningful exercise for millions of people with benefits that include "better overall health and balance, as well as an improved sense of psychological well being" [16] so it seemed plausible that practicing martial arts could positively contribute to one flourishing with greater psychological well-being. Nonetheless, recent studies on martial arts had not yet been reviewed and integrated under the PERMA framework from positive psychology to further explore and explicate this possibility.

So in order to further investigate whether martial arts practice could be used to help one flourish with greater psychological well-being, this article reviewed and discussed recent research from martial arts and psychological well-being to investigate whether practicing martial arts could be used to positively influence emotions, engagement or flow experience, interpersonal relationships, the sense of meaning or purpose in life, and personal accomplishments. Specifically, "The Influence of Martial Arts on Positive Emotion" drew upon the literature to argue that martial arts can be used to positively influence emotions, "The Influence of Martial Arts on Engagement" drew upon the literature to argue that martial arts can be used to positively influence engagement or flow experience, "The Influence of Martial Arts on Relationships" drew upon the literature to argue that martial arts can be used to positively influence interpersonal relationships, "The Influence of Martial Arts on Meaning" drew upon the literature to argue that martial arts can positively influence the sense of meaning or purpose in life, and "The Influence of Martial Arts on Accomplishment" drew upon the literature to argue that martial arts can be used to positively contribute to personal accomplishments. In this way the present article contributes to the extant literature on martial arts and psychological well-being by undertaking an integrative review of the literature to demonstrate that practicing martial arts can positively influence all five of the characteristic components of psychological well-being (PERMA), and consequently, that there is good reason to believe that practicing martial arts can positively contribute to one flourishing with greater psychological well-being or mental health. In short, I have argued here that martial arts practice and participation (usually with others) on a regular basis is an active and productively effective form of activity that typically engages a variety of different *intrapersonal* cognitive-emotional components (such as those involving memory, affect, and sensorimotor integration) as well as *interpersonal* social partners (such as those that one practices *forms* or *kata* with, or competes with in freestyle competition), and that consequently, practicing martial arts is a genuinely productive activity that is fully capable of positively influencing both our personal and social lives.

Competing interests

The author declares that has no competing interests.

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