

Purpose in Life (*Ikigai*), a Frontal Lobe Function, Is a Natural and Mentally Healthy Way to Cope with Stress

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Stress can cause anxiety that creates imbalances in the autonomic nervous system and internal secretions leading to mental and somatic disease. Purpose in life (*PIL*) and *ikigai* (two social attitudes) help individuals to integrate psychological events and effectively cope with stress. *PIL/ikigai* provides an intrinsic motivation and is thought to develop primarily during adolescence. There is a correlation with such positive experiences as spending time in beautiful natural surroundings and exposure to warm human relationships at various developmental stages. *PIL/ikigai* is a physiological frontal lobe function. Adolescence is a critical period of development for *PIL/ikigai* and neuronal connections are strengthened by secretion of neurotransmitters such as dopamine and β -endorphin. We propose that there is an important physiological role of *PIL/ikigai* and that critical periods of brain development influence development of *PIL/ikigai*.

Keywords: Stress; Anxiety; Happiness; Purpose in Life/*Ikigai*; Frontal Lobe

Introduction

Happiness is defined psychologically as a multidimensional construct composed of both emotional and cognitive elements (Bekhet, Zauszniewski, & Nakhla, 2008; Hills & Argyle, 2001) and is frequently identified as having positive affect or joy, a high average level of satisfaction *over a period of time*, and the absence of negative feelings such as depression and anxiety (Argyle & Crossland, 1987; Bekhet et al., 2008). Additionally, raising personal income or financial advantage which comes from an external source, does not increase happiness which is a subjective feeling of well-being (Easterlin, 1995; Easterlin, McVey, Switek, Sawangfa, & Zweig, 2010; Frey & Stutzer, 2002; The Nihon Keizai Shimbun, January 20, 2012). The amount of income is not always steady and this fact is described in Japanese literature (Akutagawa, 1968). Many specialists propose that a new indicator of happiness, i.e., subjective well-being, should be developed rather than relying on economic indicators, such as Gross National Product (GDP) (The Nihon Keizai Shimbun, January 20, 2012). A person feels happiness when he/she performs a task based on intrinsic motivation, such as the pleasure of doing the task itself (Argyle & Crossland, 1987; Hills & Argyle, 2001). Furthermore, a person experiences pleasure when others offer praise or positive feedback (Akutagawa, 1968; Argyle & Crossland, 1987; Hills & Argyle, 2001); however, praise is not always given, even if well deserved (Akutagawa, 1968). Many people experience stress. Any stress that contributes to anxiety causes an imbalance of the autonomic nervous system and internal secretions and these processes can lead to mental and somatic disease, such as depression and coronary heart disease (Atkinson et al., 1996; Ishida & Okada, 2006; Smith, Nolen-Hoeksema, Fredrickson, & Loftus, 2003). Anxiety also sometimes leads to drug or alcohol dependence, or gambling problems, which have serious consequences, such as psychiatric and somatic disease and family dysfunction (Carlson, 2007; Neale, Netleton, & Pickering,

2011). Many techniques for coping with and treating stress have been proposed by philosophy, religion, literature (e.g., Camus, 1942; Damrosch, 2003; Jisei, 1600; Kierkegaard, 1844; Moore, 1951; Phenix, 1966; Rousseau, 1762; Zeami, 1400) and modern medicine (Freddi & Romàn-Pumar, 2011; Jetter, 1992; Ogawa, 2005). However, the former are less evidenced based and the latter deals mainly with patients.

Recently, we clarified that having purpose in life (*PIL*) and *ikigai* can effectively help individuals to cope with stress (R. Ishida, 2008a; R. Ishida, 2008b; R. Ishida, 2011; Ishida & Okada, 2006; Ishida & Okada, 2011a; Ishida & Okada, 2011b; Ishida & Okada, 2011c; Ishida, Okada, & Bando, 2004a; Ishida, Okada, & Bando, 2004b). Additionally, brain research has advanced remarkably in recent years. In this paper, we propose the psychological and physiological significance of *PIL/ikigai*.

Psychological Benefits of *PIL/ikigai*

Every person *naturally* has a strong desire and drive to establish meaning in life. This is based on intrinsic motivation, which develops more fully during adolescence compared to other developmental stages (Atkinson et al., 1996; Smith et al., 2003). Lack of meaning in life or failure to find purpose leads to feelings of emptiness and anxiety, which interfere with feelings of subjective well being, i.e., happiness (Frankl, 1972a, 1972b, 1975; Kamiya, 2004). The term "*PIL*" is drawn from existentialism that developed in Europe (Kida, 2006). The term "*ikigai*" appeared in Japanese classical literature and has been used for a long time (Goto & Kamada, 1960). Both *PIL* and *ikigai* have long histories and share a common core theme: "Everything changes and life is a one time only opportunity. Every person has a need for a meaningful life (Goto & Kamada, 1960; Kida, 2006; Komatsu, 2009; Takagi, Ozawa, Atsumi, & Kindaichi, 1959)." *Now, here, and ambition* are considered important in *PIL/ikigai* (R. Ishida, 2011; Ofman, 1980).

Our studies show that *PIL/ikigai* provides people with the

ability to integrate stressful psychological events from the past, present, and future with less conflict or confusion (R. Ishida, 2008a; R. Ishida, 2008b; Ishida & Okada, 2006; Ishida & Okada, 2011a; Ishida & Okada, 2011c; Ishida et al., 2004a; Ishida et al., 2004b). This ability results in decreased anxiety and lower sympathetic nervous system activity during events that cause psychological and physical stress, such as when performing a time-limited task that will be evaluated by others, or when meeting a person for the first time (Ishida & Okada, 2006; Ishida & Okada, 2011b; Ishida & Okada, 2011c; Ishida et al., 2004a; Ishida et al., 2004b). *PIL/ikigai* also decreases psychiatric/somatic symptoms that occur in stressful societies (Ishida & Okada, 2006). This effective technique of coping with stress in *PIL/ikigai*, in turn, influences the immune function and decreases the mortality risk (e.g., Kremer & Ironson, 2009); previous studies related to these findings were supported by R. Ishida (2011). Furthermore persons with *PIL/ikigai* have traits such as the ability to delay gratification, appreciate another's point of view, trust in a higher power, accept personal limitations, or count personal blessings (Kamiya, 2004; Frankl, 1972a, 1972b, 1975). These protective mechanisms and personality traits could be supported by brain functions related with pleasure.

Brain, Neurotransmitters, and Stress

When we propose the importance of *PIL/ikigai*, it is necessary to discuss preliminary evidence. The frontal lobe, which has synaptic connections with other areas of brain, is more developed in humans than other mammals. The functions include mental integration, planning for voluntary activity, and ambition (Brodal, 1998). This suggests that *PIL/ikigai* correlates with a frontal lobe function. The synaptic connections are strengthened by repeated secretion of neurotransmitters such as dopamine and β -endorphin which correlate with intrinsic motivation and/or pleasure (Atkinson et al., 1996; Carlson, 2007; Hawkes, 1992; Levinthal, 1988; Martin et al., 2009; Solomon et al., 2011). The critical period of prefrontal lobe development is adolescence (Atkinson et al., 1996; Brodal, 1998; Smith et al., 2003), during which the synaptic connections and the function of the organ develop more rapidly compared to other growth periods (Brodal, 1998; Brown et al. 2001; Korelitz & Ernst, 2009; Mesulam, 2002).

Stress can have a psychological, physical or chemical etiology, resulting from human relations, a change of environmental temperature, restraints, hemorrhage, vulnus, or infusion of various drugs (e.g., Selye, 1936, 1973). Any kind of stress can cause anxiety (e.g., Ishida & Okada, 2011a; Ishida & Okada, 2011b) and influence the autonomic nervous function controlling homeostasis, as stated by Cannon (1939). Selye (1936, 1973) proposed that any kind of stress induces a *non-specific response* in the internal organs, such as adrenal cortex hypertrophy. The response process has three stages: the alarm reaction, resistance, and exhaustion. Prolonged exhaustion leads to death.

This evidence shows that mind, brain function and chemical traits of neurotransmitters are correlated with each other.

Development of *PIL/ikigai*

Infants and young children are emotionally and psychologically protected by parents and teachers. Older children and

adolescents are progressively separated from parental support and exposed to real society. Real society offers multiple stimuli that create serious stress; therefore the basic ability to cope with stress occurs during adolescence. Adolescence is a critical period for development of the frontal lobe and *PIL/ikigai* (Brodal, 1998; Brown et al., 2001; Korelitz & Ernst, 2009; Martin et al., 2009). During adolescence every person has a chance to establish basic techniques for coping with stress, i.e., *PIL/ikigai*. The establishment of *PIL/ikigai* during adolescence parallels, Rousseau's proposal (1762) that adolescence is a period of "second birth" compared with physiological birth.

We clarified that positive experiences, such as sympathetic attitudes from others, affection for persons and events and spending time in beautiful natural surroundings helps to develops *PIL/ikigai* (e.g., R. Ishida, 2008a). We also clarified that motivation that is based on a strong need for approval, which is then reinforced by excessive expectations from parents and teachers, decreases *PIL/ikigai* (Ishida & Okada, 2011a). Future research is needed to test the hypothesis that *PIL/ikigai* develops during adolescence.

Persons with or without *PIL/ikigai*

Educators propose that every person should have a personal philosophy that shapes and guides their contributions to society. In other words, a strong *PIL/ikigai* helps individuals, their children and strengthens the development of society (The Fukushima Minyu, January 18, 2012). Regardless of occupation, age, sex, or surroundings (R. Ishida, 2008b; Ishida & Okada, 2011b; The Manichi Shimbun, October 31, 2001), people without *PIL/ikigai* experience emptiness and anxiety, while those with *PIL/ikigai* retain satisfaction, pleasure, and ambition even in harsh environments (Frankl, 1972a, 1972b, 1975; Kamiya, 2004; Kuroda, 1969). Some examples of *PIL/ikigai* are discussed below.

The first examples relate to persons who do not have or fail to draw strength from *PIL/ikigai*. With intensive study and effort, students or youths succeeded in passing examinations to enter universities or private companies; however after several months, they felt empty and deeply depressed (I. Ishida, 2008; Saito, 2008). A middle-aged employee had mental and somatic disease because of workload and critical evaluations from his supervisor and customers. He was strongly motivated to obtain approval and praise from them (Hayashi, 2011). A man had high status in his company and devoted himself to the job with zealous responsibility, satisfaction and pleasure. After retirement, his life had no meaning and he suffered depression and alcohol dependence (Kanada, 2009). These persons lost meaning in life during these periods of change or stress.

Other examples relate to persons with *PIL/ikigai*. "The East Japan Enormous Earthquake (March 11, 2011)" was accompanied by tsunami and serious incidents at a nuclear power plant (Tokyo Electric Co., Ltd., in Fukushima Prefecture). Many people were injured or killed and there was tremendous damage to public and private property (The Niigata Nippo, March 12, 2011; The Asahi Shimbun, March 12, 2011). A geisha, who had extensive training in the art of dancing, singing, and providing entertainment, lived in a gymnasium, after escaping from her house. She taught her skills in traditional Japanese musical instruments to other young geisha girls who traveled great distances to learn from her. Her students and other persons living in the gymnasium experienced great satisfaction and pleasure because she shared her skills (The Yomiuri Shimbun, July 10,

2011). The hula girls in Fukushima Prefecture are famous and many tourists attend their performances. Although most of the dancing girls, their families and their theater were adversely affected by the earthquake, they decided to continue the hula for victims and people living in other prefectures. Recently, the theater was rebuilt by local efforts, thus the dancing girls and supporters were glad that the hula dancing continued (The Fukushima Mimpo, January 18, 2012). “Soma-ryu-yamaodori” is a traditional dance of the area of Soma in Fukushima Prefecture. However the earthquake killed some members of the dance troupe, while others had to evacuate to other areas; thus a planned exhibition was cancelled. Recently, the members of the troupe met and overcame the difficulties and took their performance to other towns because their town was too extensively damaged. Many people, including residents from the troupe’s hometown were moved to tears during the performance. The troupe desired to dance in their hometown to pay tribute to the memory of those lost and to encourage survivors to rebuild the town. (The Fukushima Minyu, January 16, 2012). Additional examples also relate to persons with *PIL/ikigai* during situations of routine life. Alcohol dependence is an important and serious issue in most countries. Researchers in the United States have studied the correlation between drinking alcohol and secretion of β -endorphin for a long time. They successfully clarified the correlation and their work could lead to the development of new treatments (The Japan Agricultural News, January 12, 2012). A farmer and his family in Japan had a strong desire to provide high quality flowers at a lower cost. The farmer, his wife, and his father and mother developed new techniques leading to effective results (The Japan Agricultural News, January 17, 2012). Many men in India work to deliver lunch to customers in offices and homes every day. They are very busy and not rich; however, they take pride in offering good service to their customers. They have few failures and seldom deliver the wrong lunch to the wrong person (The Sankei Shimbun, January 22, 2012). Many counselors in different countries support persons with drug or alcohol dependence, or gambling problems. Successfully helping clients with dependency issues to achieve in meaning of life, (i.e., *PIL/ikigai* for clients) results in subjective well-being for the counselors (e.g., Gavle, 2009; Neale, Nettleton, & Pickering, 2011; Oei, & Gordon, 2008; Waisberg & Porter, 1994).

These examples demonstrate that contributing to others’ pleasure rather than receiving praise from others creates subjective well-being for the doers.

Proposals for Development of *PIL/ikigai* in Daily Life

Not only recent evidence (e. g., R. Ishida, 2008a; Brown, Keynes, & Lumsden, 2001; Bundra, 1979) but also classical documents (e.g., Rousseau, 1762; Zeami, 1940) contribute to the development of *PIL/ikigai*. We propose that development of *PIL/ikigai* occurs according to both evidence and classical theory. Parents, teachers, and society should offer children various kinds of positive experiences during each developmental stage, starting in infancy, with consideration for each critical developmental period of the brain. Spending sufficient time in beautiful natural surroundings where ponds and rivers exist; where trees, flowers, and plants grow; and insects, fishes, and mammals live, provides opportunities for children to explore, catch fish, and collect plants or insects with their friends. These ex-

periences enrich their hearts and minds and allow them to feel pleasure and comfort. Other opportunities should include, encouraging them to sing a wide variety of songs; listening sympathetically; praising moderately; encouraging interesting projects such as making a house out of wood using a hammer and a saw; or using small machines and puzzles which allow the child to take the object apart and put it back together again. Such activities encourage solving problems using the mind and the hands. These types of activities could contribute to the ability to integrate psychological events and maximize sensory stimuli. These good events are then memorized by the brain. However, parents should not force children to learn too much or expect them to grasp complex knowledge that is beyond their level. Ignoring the critical period and their interests and giving too many detailed instructions about their behavior does not help them to develop the ability to cope with stress. Overzealous expectations can prevent natural and sufficient development of the brain and this could ultimately lead to a reduced ability to cope with stress in the future. Many youth study at senior high school and university or work in real society, and these are significant activities that are important for the self and the society. It should be noted that youth can be pushed to be too busy or to have an excessive need for approval. Their motivation and sense of self may become locked into going to a “good university”, being hired by a “good company”, and aspiring to a “good status”. Fixation on reaching these “good” goals can prevent the chance to think deeply and create *PIL/ikigai* as their intrinsic motivation. It is important for youth, however, to have many positive and interesting challenges which vary according to individual interests; for example, reading books, playing sports with friends, drawing pictures, playing and/or listening to music, going on tours, or doing volunteer work. These proposals do not necessarily mean that all the activities should continue during their lifetime. Challenging experiences that occur from infancy to adolescence produce satisfaction and pleasure accompanied by secretion of neurotransmitters such as dopamine and β -endorphin. The brain memorizes the experiences and helps them to establish and/or modify *PIL/ikigai* in the future.

A Brief Look at Evolution

Cannon (1939) noted that, “only by understanding the wisdom of the body, shall we attain that mastery of disease and pain which will enable us to relieve the burden of mankind.” It is said evolution is performed over time resulting in survival of the species, i.e., adaptation to changed environments (Solomon et al., 2011). Successful adaptation to environments causes increased satisfaction, pleasure and less anxiety (e.g., R. Ishida, 2008b; Ishida & Okada, 2006). By understanding *PIL/ikigai* (using frontal lobe function), we can understand one of the wisdoms of the body. Limited physical evidence is currently available; thus, we hypothesize that a mixture of positive experiences, such as being in beautiful natural surroundings and having warm human relationships influence evolution over time. These positive experiences contribute to the development of *PIL/ikigai* as an effective technique of coping with stress.

Conclusion

The human brain, especially the frontal lobe, is highly evolved compared to other mammals. Humans have the ability to integrate experiences and adolescence is a critical period for

development. It is natural for all humans to establish *PIL/ikigai* using the frontal lobe. *PIL/ikigai* is an effective technique for coping with stress and could influence longevity.

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