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THE AFFECTIVE RESPONSE MODEL: A THEORETICAL FRAMEWORK OF AFFECTIVE CONCEPTS AND THEIR RELATIONSHIPS IN THE ICT CONTEXT

Ping Zhang
School of Information Studies, Syracuse University,
Syracuse, NY 13244 U.S.A. {pzhang@syr.edu}

Appendix A

Summary of Affective Concepts/Constructs in the ICT Literature

ARM ID	Original Construct	Article	Operational Definition
1	Perceived mood	Ang et al. 1993	(no definition) Measured by: The feedback giver looked as if he had had a bad day; seemed to be in a good mood today; looked as if he did not want to be disturbed.
1	Mood	Loiacono and Djamasbi 2010	An individual's mild, enduring, and objectless affective state (Fredrickson 2003; Isen et al. 2003; Lazarus 1991). One's global feeling state at a given time. Moods are not necessarily a product of reflection or cognitive analysis, but simply describe how people feel at a moment.
2	Trait anxiety	Igbaria and Parasuraman 1989	Reflects a chronic and generalized predisposition to be anxious and nervous.
2	Playfulness as Trait	Venkatesh 1999	The pleasure and inherent satisfaction derived from a specific activity.
2	Negative Affectivity	Thatcher and Perrewe 2002	The general experience of negative emotions such as guilt or shame regardless of the situation.
2	Trait anxiety	Thatcher and Perrewe 2002	The general feeling of anxiety when confronted with problems or challenges.
3	Design factors	Kim et al. 2003	Of background: shape, texture, color. Of relation: match title, menu, images.
3	Visual Characters of Web Pages	Lindgaard et al. 2006	(no definition) Measured by interesting–boring, good design–bad design, good color–bad color, good layout–bad layout, imaginative– unimaginative, simple–complex, clear–confusing.
3	Web Page Aesthetics	Robins and Holmes 2008	A low aesthetic treatment (LAT) is one in which content is simply placed on a web site without professional graphic design. A high aesthetic treatment (HAT) presents a professional look and feel appropriate to the organization it represents.
3	Mood relevant cues	Parboteeah et al. 2009	The characteristics, such as visual appeal, that affect the degree to which a user enjoys browsing a website but that do not directly support a particular shopping goal.

ARM ID	Original Construct	Article	Operational Definition
4	Flow	Ghani et al. 1991	Holistic sensations that people feel when they act with total involvement.
4	Flow	Trevino and Webster 1992	Characterizes the perceived interaction with CMC technologies as more or less playful and exploratory. Has four dimensions: control, focused attention, aroused curiosity, intrinsically interested.
4	Positive Mood	Webster and Martocchio 1992	No specific definition provided. Just implied it is a "demonstrated subjective experiences resulting from higher playfulness."
4	Flow	Webster and Martocchio 1995	Is characterized by arousal of curiosity and by the extent to which the user finds the interaction intrinsically interesting.
4	Mood	Venkatesh and Speier 1999	A state variable, refers to how people feel when they are engaged in any number of activities (George and Jones 1996).
4	Cognitive Absorption	Agarwal and Karahanna 2000	A state of deep involvement with IT. It has five components including curiosity, control, temporal dissociation focused immersion, heightened enjoyment.
4	Satisfaction	Bhattacherjee 2001; Bhattacherjee and Premkumar 2004	A psychological or affective state related to and resulting from a cognitive appraisal of the expectation-performance discrepancy.
4	Concentration	Koufaris 2002	The holistic sensation that people feel when they act with total involvement.
4	Secondary Emotion	Kim et al. 2003	A non-basic, individual-dependent, and domain specific emotion derived from the primary emotions (Averill 1994). A concept that is closely related to the secondary emotion is aesthetic responses or affects. The secondary emotion is usually elicited by external stimuli.
4	Anxiety	Venkatesh et al. 2003	Evoking anxious or emotional reactions when it comes to performing a behavior (e.g., using a computer). Measured by: I feel apprehensive about using the system; It scares me to think that I could lose a lot of information using the system by hitting the wrong key; I hesitate to use the system for fear of making mistakes I cannot correct; The system is somewhat intimating to me.
4	Computer/ system anxiety	Hackbarth et al. 2003; Hwang and Kim 2007	The apprehension or fear that results when an individual is faced with the possibility of using an IS.
4	CMC anxiety as application specific anxiety	Brown et al. 2004	An individual's level of fear or apprehension associated with actual or anticipated use of IT to communicate with others. Measured by: Using email makes me nervous; using email makes me uneasy; I feel comfortable using email (R); I would be comfortable sending email messages that I know a lot of people will read (R); while composing an email message to someone I don't know, I feel tense; I would be fearful of sending email to someone I don't know.
4	Flow	Hsu and Lu 2004	An extremely enjoyable experience, where an individual engages in an online game activity with total involvement, enjoyment, control, concentration, and intrinsic interest.
4	Positive emotion, negative emotion	Cenfetelli 2004	(no definition) Measured by Diener et al. (995): Negative = shame, embarrassment, loneliness, fear, depression, sadness, rage, nervousness, disgust, regret, worry, anger, unhappiness, anxiety, irritation. Positive = happiness, contentment, love, affection, caring, pride, fondness, joy.
4	Customer Satisfaction	Kim et al. 2004	Is an affective state that is the emotional reaction to a transaction experience (Spreng et al. 1996). Measured by: I am satisfied with the transaction with this store; I am pleased ...; I am contented ...; I am delighted ….
4	Perceived Playfulness	Lin et al. 2005	Is regarded as an individual state because an individual can feel more or less playful at various points during his/her visit to a web portal.

ARM ID	Original Construct	Article	Operational Definition
4	Feeling (pleasure, arousal)	Kim et al. 2007	Feelings and emotions are treated synonymously. Has pleasure and arousal as main components of feelings: pleasure – the degree to which a user feels good or happy with the target object; arousal – refers to the degree to which a user feels excited, stimulated, or active.
4	Concentration Transcendence of self Transformation of time Perceived control Mergence of action and awareness Autotelic experience	Guo and Poole 2009	All based on Csikszentmihalyi's (1990) flow theory.
4	Joy and Fear	Li et al. 2008	Emotional responses to interacting with a vendor's website: joy is positive affective state, fear is negative affective state.
4	Irritation	McCoy et al. 2008	Irritation by ads is a feeling of annoyance as the advertisement has interrupted the user so much that she is unable to continue her task.
4	Emotion (excitement, happiness, anger, anxiety)	Beaudry and Pinsonneault 2010	Emotions are defined as a mental state of readiness for action that arises from the appraisal of an IT event (in this study, the IT event is the announcement of the imminent deployment of a new system).
4	Positive Affect	Zaman et al. 2010	Co-occurrence of positive emotional states, such as joy, interest, excitement and confidence.
4	Flow	Zaman et al. 2010	Two dimensions: concentration and enjoyment (no definition for either).
4	Affective involvement	Jiang et al. 2010	Refers to the heightened emotional feelings associated with a website and is made up of feeling states.
4	Negative reaction to scanning	Suh et al. 2011	(no definition) Measured by: Describe the extent to which the following wards describe your typical feelings when being scanned (Diener et al. 1995): shame, sadness, anger.
5.1	First Impression	Schenkman and Jonsson 2000	The first visual impression that a person gets of a web page.
5.1	Aesthetics (of the Web pages)	Hall and Hanna 2004	To the extent a web page is pleasing and stimulating to the eye.
5.1	Hedonic Attributes	Hassenzahl 2004	One of the two groups of a product's perceived characters: the one that are primarily related to the users' self. Contains two aspects: stimulation (being challenging and novel; a prerequisite of personal development, i.e. the proliferation of knowledge and development of skills) and identification (the human need to express one's self through objects).
5.1	Perceived affective quality	Benlian et al. 2010; Zhang and Li 2004; Zhang and Li 2005; Zhang et al. 2006	An individual's perception of the ability of a stimulus such as IT to change his or her core affect.
5.1	Immediate Impression of Visual Appeal	Lindgaard et al. 2006	A physiological, hard-wired reaction to objects in one's environment that requires no learning.
5.1	Immediate Aesthetic Perception	Tractinsky et al. 2006	Visually pleasing.
5.1	Classic and Expressive Aesthetic Perceptions	Tractinsky et al. 2006	Classic: orderliness or clarity of the design. Expressive: the creativity and the richness of the design.
5.1	Beauty	Tractinsky et al. 2006	Perception of aesthetics of ATM layouts.
5.1	Perceived Entertainment	Gao and Koufaris 2006	Reflects a website's ability to enhance the experience of visitors to the site.

ARM ID	Original Construct	Article	Operational Definition
5.1	Perceived Irritation	Gao and Koufaris 2006	(no definition) Measured by: This website is frustrating, irritating, annoying.
5.1	Perception of an IT's capability to induce positive affect and negative affect	Zhang and Li 2007	Perception of an IT's Capability to induce Positive Affect (PC-PA) is an individual's perception or evaluation that an IT has the capability to induce positive affect in him or her; and Perception of an IT's Capability to induce Negative Affect (PC-NA) is the person's perception that an IT has the capability to induce negative affect in him or her.
5.1	Aesthetic Perception	van Schaik and Ling 2009	Perceived attractiveness.
5.2	Attitude	Trevino and Webster 1992	Attitude toward particular CMC technology email and voice mail. Measured by: Dreary/fun, unpleasant/enjoyable, cold/warm, mundane/challenging, humanizing/dehumanizing.
5.2	Web page preference	Schenkman and Jonsson 2000	(no definition) Single item measure: preferred completely.
5.2	Beauty	Hassenzahl 2004	A high level evaluative construct that is an expression of authoritative judgment of being ugly or beautiful (vs. substantive or low level determinants such as elegance).
5.2	Attitude	Brown et al. 2004	Is a person's affective evaluation of a specific object.
5.2	Attitude	Galletta et al. 2004	Is defined as the satisfaction with the site.
5.2	Satisfaction (attitude toward an object)	Wixom and Todd 2005	A person's feelings or attitudes toward a variety of factors affecting that situation.
5.2	Satisfaction with Decision Aid	Hess et al. 2006	Attitudes toward this task or object.
5.2	Attitude toward a site	Gao and Koufaris 2006	A positive affective variable.
5.2	Affective Commitment	Li et al. 2006	A situation in which an end user demonstrates an affective and emotional attachment to the relationship with an e-vendor.
5.2	Attitude	McCoy et al. 2008	Overall reactions to the website.
5.2	Emotional attachment	Suh et al. 2011	An emotion-laden, target-specific bond between a person and a pecific object (Thomson et al. 2005, p. 77). A personal affection for a specific object connected with him or her such as pets, gifts, or a brand.
6.1	Perceived Enjoyment	Chin and Gopal 1995; Chin et al. 2003; Davis et al. 1992; Hong and Tam 2006; Hwang and Kim 2007; Igbaria et al. 1996; Lin et al. 2005; Parboteeah et al. 2009; Thong et al. 2006; van der Heijden 2004; Venkatesh 2000; Venkatesh and Bala 2008; Yi and Hwang 2003	The extent to which the activity of using the computer is perceived to be enjoyable in its own right, apart from any performance consequences that may be anticipated (Davis et al. 1992, p. 1113).
6.1	Intrinsic Motivation (operationalized as perceived enjoyment)	Venkatesh 1999; Venkatesh et al. 2003; Venkatesh and Speier 1999; Venkatesh et al. 2002	The extent to which the activity of using the computer is perceived to be enjoyable in its own right, apart from any performance consequences that may be anticipated (Davis et al. 1992, p. 1113).

ARM ID	Original Construct	Article	Operational Definition
6.1	Emotion	Agarwal and Venkatesh 2002; Venkatesh and Agarwal 2006; Venkatesh and Ramesh 2006	The extent to which a website evokes emotional reactions from you (a user).
6.1	Perceived Playfulness	Chung and Tan 2003; Moon and Kim 2001	The strength of one's belief that interacting with the WWW will fulfill the user's intrinsic motives. Has three aspects: attention is focused, curious during interaction, interaction enjoyable/interesting.
6.1	Shopping Enjoyment	Jiang and Benbasat 2007; Koufaris 2002	An affective or emotional response as part of experience in shopping online. Measured by: I found my visit interesting, enjoyable, exciting, fun.
6.1	Perceived Playfulness	Fang et al. 2006	The extent to which the activity of using a specific system is perceived to be enjoyable in its own right, aside from any performance consequences resulting from system us.
6.2	Attitude	Chau and Hu 2001; Davis 1989; Davis et al. 1989; Venkatesh et al. 2003	An individual's positive or negative feelings (evaluative affect) about performing the target behavior.
6.2	Affect	Thompson et al. 1991	Affect toward PC use: the feelings of joy, elation, or pleasure, or depression, disgust, displeasure, or hate associated by an individual with a particular act. Affect is the affective component of attitude. Measured by: PCs made work more interesting; working with PCs was fun, PCs were all right for some jobs but not the kind of job wanted.
6.2	Affect	Thompson and Higgins 1994	Feeling toward using a personal computer.
6.2	Attitude	Karahanna et al. 1999	The individual's positive and negative evaluations of performing the behavior.
6.2	Affect (= attitude)	Limayem and Hirt 2003	Emotional response to the thought of the behavior.
6.2	Attitude	Mathieson 1991	The user's evaluation of the desirability of his or her using the system.
6.2	Attitude	Bhattacherjee and Sanford 2006; Moon and Kim 2001; Taylor and Todd 1995	Satisfaction with process and outcomes; The strength of one's willingness to use an ICT. Measurement adopted from Taylor and Todd (1995): Using (XYZ) in my job is a (bad … good) idea; (foolish … wise) idea; (unpleasant … pleasant) idea; overall, I (dislike … like) the idea of using (XYZ) in my job.
6.2	Affective Reward	Reinig et al. 1996	Sense of emotional gratification often expressed by participants after a successful meeting, or the positive emotional response sometimes associated with goal attainment. Measured by: This process was stimulating, fulfilling, arousing; today's meeting was satisfying, dissatisfying; this session was dull, boring, interesting; I felt motivated to generate a large number of ideas; solving the problem was gratifying; I did not enjoy myself; it felt like we won; we really accomplished something here today; I'd like to participate in another scenario.
6.2	Attitude	Jackson et al. 1997	An individual's positive or negative feelings (evaluative effect) about performing the target behavior (from Fishbein and Ajzen 1975).
6.2	Satisfaction	Devaraj et al. 2002	An ex post evaluation of consumers' experience with the service and is captured as a positive feeling, indifference, or a negative feeling.
6.2	Satisfaction	Teo et al. 2003	Satisfaction towards commercial website measures the affective appeal of commercial Web sites through a sense of involvement, control and affective feelings.
6.2	Attitude	Bhattacherjee and Premkumar 2004	Personal affect toward IT usage. Measured by: All things considered, using ~ will be a bad idea/good idea; foolish move/wise move; negative step/positive step; ineffective idea/effective idea.

ARM ID	Original Construct	Article	Operational Definition
6.2	Attitude	Hong et al. 2004; Hong et al. 2005; Malhotra and Galletta 2005; Wixom and Todd 2005	An individual's positive or negative feelings about performing a behavior (Ajzen and Fishbein 1980).
6.2	Satisfaction	Lin et al. 2005	Satisfaction in using web portal. Measurement adapted from Spreng and Olshavsky (1993): Using the web portal makes me feel very satisfied; very pleased; very contented; very delighted.
6.2	Attitude	Lim et al. 2006	The belief that purchasing from iBook should, with good probability, result in either an overall positive or an overall negative outcome.
6.2	Attitude	Kim et al. 2007	This study conceptualized attitude from the judgment perspective as the individual's positive and negative evaluations of performing the behavior.
6.2	Attitude	Jiang and Benbasat 2007	Attitude toward shopping at a website refers to their overall evaluations of a shopping experience at a particular website. Measured by: I like shopping on this website; shopping on this website is a good idea; shopping on this website is appealing.
6.2	Enjoyment	Nah et al. 2011	The hedonic outcome that can result from the experience. Measured by: I found my virtual tour of <xxx> enjoyable, boring, interesting, fun.
7	Attitude	Igbaria and Parasuraman 1989	Attitudes toward microcomputers are conceptualized as having three components: cognitive (knowledge or perception of the object), affective (feelings or emotional reactions) and behavioral (predisposition to act in a certain way toward the object).
7	Attitude	Agarwal and Prasad 1999	The mediating affective response between beliefs and usage intentions. A learned implicit response that refers to an individual's evaluation of a concept.
7	Attitude	Teo et al. 2003	Predispositions to respond in a particular way towards a specified class of objects (Rosenberg 1960). Affective component refers to the feelings formed without conscious thoughts and they can be expressed in verbal statements of affect. Cognitive component consists of the ideas and beliefs formed through conscious thoughts and they can be expressed in verbal statements of beliefs and values.
8	Computer anxiety	Igbaria and Parasuraman 1989	The tendency of a person to be uneasy, apprehensive, or fearful about the current or future use of computers in general.
8	Microcomputer playfulness/Computer playfulness	Agarwal and Karahanna 2000; Agarwal and Prasad 1998; Hess et al. 2006; Venkatesh 2000; Venkatesh and Bala 2008; Webster and Martocchio 1992	The degree of cognitive spontaneity in microcomputer interactions (Webster and Martocchio 1992), an individual difference variable.
8	Cognitive playfulness of microcomputers	Webster and Martocchio 1995	A situation-specific individual characteristic that represents a type of intellectual playfulness. The degree of cognitive spontaneity in microcomputer interactions.
8	Affect	Compeau and Higgins 1995; Compeau et al. 1999	Liking of particular behavior. Measurement drawn from computer attitudes scale (Loyd and Gressard 1984): I like working with computers; I look forward to those aspects of my job that require me to use a computer; Once I start working on the Computer, I find it hard to stop; Using a computer is frustrating for me; I get bored quickly when working on a computer.

ARM ID	Original Construct	Article	Operational Definition
8	Computer Anxiety	Brown et al. 2004; Compeau and Higgins 1995; Compeau et al. 1999; Harrison and Rainer Jr 1992; Venkatesh 2000; Venkatesh and Bala 2008; Webster and Martocchio 1992	The tendency of individuals to be uneasy, apprehensive, or fearful about current or future use of computers.
8	Computer Anxiety	Thatcher and Perrewe 2002	About the implications of computer use such as the loss of important data or fear of other possible mistakes.
8	Computer Playfulness	Hackbarth et al. 2003	Refers to an individual's tendency to interact spontaneously with a computer (Webster 1989). It is defined as being a system specific trait that can change because the experience in using a specific technology increases over time.

Appendix B

Summary of Relationships Among Affective Concepts in the ICT Literature

See Appendix A for definitions of the involved affective concepts.

Article	Empirical Relationship	Theoretical Justification/Implication	Corresponding ARM Proposition	
Igbaria and Parasuraman 1989	Trait anxiety → Computer anxiety	More general anxieties are determinants of more specific ones.	2 → 8	P0b
	Computer anxiety → attitudes toward computers	Computer anxiety operates an intervening variable between individual differences and attitudes toward computers. A reduction in computer anxiety will improve attitudes toward computers.	8 → 7	P10
Trevino and Webster 1992	Flow → attitudes toward CMC technologies	Previous studies show that positive affect, pleasure, and satisfaction result from the flow experience; IS that provides more perceived control (a flow dimension) results in more positive user attitudes and satisfaction.	4 → 5.2	P3
Webster and Martocchio 1995	Cognitive playfulness of microcomputer → flow	Flow is an outcome of the individual characteristics of playfulness.	8 → 4	P1
Venkatesh and Speier 1999	Mood → Intrinsic motivation (perceived enjoyment)	Based on both the associative network model and the resource allocation model. Positive moods result in more favorable assessments of one's abilities thus potentially increasing perceptions of enjoyment and thereby intrinsic motivation. Additionally, individuals in positive moods tend to use heuristic (as opposed to analytical) processing, resulting in increased creativity and playfulness, leading to greater task enjoyment and thus greater intrinsic motivation. Negative moods result in more pessimistic assessments regarding oneself and the adequacy of existing knowledge, which in turn generates uncertainty and/or lack of confidence in one's ability and can result in a negative judgment towards a given situation.	4 → 6.1	P3

Article	Empirical Relationship	Theoretical Justification/Implication	Corresponding ARM Proposition	
Agarwal and Karahanna 2000	Computer playfulness → cognitive absorption	Individual traits are likely to have an effect on experiential states.	8 → 4	P1
Schenkman and Jonsson 2000	First impression ↔ Webpage preference	In the framework of evolutionary psychology, the appreciation of beauty is seen as hard-wired into our genetic set-up and the aesthetic feeling fulfills an adaptive, biological function.	5.1 → 5.2	P7
Moon and Kim 2001	Perceived playfulness → attitude toward use	Attitudinal outcomes, such as positive affect, pleasure, and satisfaction, result from the playful experience.	6.1 → 6.2	P7
Thatcher and Perrewe 2002	Trait affectivity → Computer anxiety	Dynamic, IT specific individual differences (i.e., computer anxiety) are a function of stable situation-specific (i.e., personal innovativeness in IT) and broad (i.e., negative affectivity and trait anxiety) traits.	2 → 8	P0b
Teo et al. 2003	Satisfaction with a website → attitude towards websites	Attitude is shaped through the internalization of value formed through affective and cognitive evaluations.	6.2 → 7	P6
Brown et al. 2004	Computer Anxiety → CMC anxiety as application specific anxiety	More general anxieties are determinants of more specific ones.	8 → 4	P1
	CMC anxiety as application specific anxiety → Attitude toward use	Individuals high in computer anxiety will have negative attitudes toward using a computer. Due to its application-specific focus, CMC anxiety is a more proximal predictor of attitude toward a CMC application than either computer anxiety or communication apprehension. Thus, it should exhibit a significant effect on attitudes regarding the CMC application, such that individuals with high CMC anxiety would have less favorable attitudes toward using the CMC.	4 → 6.2	P3
Hassenzahl 2004	Hedonic attributes ↔ beauty	Beauty is rather related to self-oriented, hedonic attributes of a product than to its goal-oriented, pragmatic attributes.	5.1 → 5.2	P7
Lin et al. 2005	Perceived playfulness → Satisfaction in using web portal	Previous research has shown that higher degrees of pleasure and involvement during computer interactions lead to concurrent subjective perceptions of positive affects and satisfaction. Attitudinal outcomes, such as positive affect, pleasure, and satisfaction, resulted from playful experiences.	4 → 6.2	P3
Wixom and Todd 2005	Satisfaction (attitude toward an object) → cognitive perceptions → attitude toward behavior	Object-based attitudes influence behavior-based attitudes via cognitive perceptions.	5.2 → 6.2	P9
Lindgaard et al. 2006	Visual characters of webpages ↔ immediate impression of visual appeal	According to the mere exposure effect (Zajonc 1980), one can quickly form immediate visual appeal impression even given an extremely short period of exposure time that does not permit cognitive processing. Feelings happen to us whether we like it or not, and they can happen in a matter of a few milliseconds.	3 → 5.1	P0c
Gao and Koufaris 2006	Perceived entertainment → attitude toward the website Perceived irritation → attitude toward the website	Uses and gratifications research indicates that the entertainment value of a commercial exchange lies in its ability to fulfill the audience's needs for escapism, diversion, aesthetic enjoyment, or emotional release. Research in traditional advertising identified irritation as a significant factor that influences consumer attitude.	5.1 → 5.2	P7

Article	Empirical Relationship	Theoretical Justification/Implication	Corresponding ARM Proposition	
Jiang and Benbasat 2007	Shopping enjoyment → Attitude toward shopping at a website	The degree to which a website is visually attractive, fun, and interesting is perceived as part of the website's system quality, which directly affects consumer satisfaction. Similarly, entertainment features that enhance shopping enjoyment improve consumers' attitudes toward shopping at a website. Therefore, the more enjoyment consumers derive from a shopping experience, the more likely that customers would prefer their online shopping experience.	6.1 → 6.2	P7
Kim et al. 2007	Feeling (pleasure, arousal) → attitude toward using mobile internet services	Users may feel pleasure as well as arousal from the services. These feelings could influence attitude according to the Elaboration Likelihood Model, where feelings operate through peripheral route processing by means of classical conditioning. Previous research has also shown that affect can influence the formation of attitude in the absence of product beliefs. Therefore, attitude formation can be done via direct affect transfer.	4 → 6.2	P3
Parboteeah et al. 2009	Mood relevant cues → perceived enjoyment	The stimulus-organism-response (S-O-R) paradigm posits that environmental cues act as stimuli that influence an individual's cognitive and affective reactions, which in turn affect behaviors (Mehrabian and Russell 1974)	3 → 6.1	P0c
Zaman et al. 2010	Flow → positive affect	Even though flow is a positive emotional state, Csikszentmihalyi (1990) argued that positive affect and flow are two distinct constructs. He explained that, while experiencing flow, a person does not realize the joy. A person feels "only what is relevant to the activity" (p. 123), and anything else would be a distraction. It is shortly after experiencing flow that they have a positive affect towards the activity.	4 →4	P11

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