Towards an HCI model for eudaimonic growth - A phenomenological inquiry into travelers' serious leisure pursuits and cultivation of character strengths

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Abstract Many people strive for a life characterized by self-growth and meaning, considered to be innate needs, by actualizing their authentic potentials during their lifespans. Positive psychology (PP) has termed this self-development process as eudaimonia—to live a virtuous life. From this perspective, such a life can be attained by individuals through cultivating key character strengths. On the other hand, the fields of leisure and tourism regard eudaimonia as the sustained pursuit of leisure activities that involve specific skills, knowledge, and experience. This study combines these two bodies of knowledge to propose a human-computer interaction (HCI) model that can facilitate individual eudaimonic growth through the serious pursuit of leisure activities applicable to the eTourism platform. By integrating concepts reported in the current literature with the results of our phenomenological investigation, we highlight three key findings to support the development of this model: 1. Individual eudaimonic development can be appreciated from both cross-sectional and developmental perspectives; 2. In addition to performance seeking behavior, individual satisfaction and fulfillment can emerge from the process of exercising one's character strengths; 3. Goal formation and introspection are specific aspects that contribute to the meaning of an experience. The proposed HCI model comprises two interrelated components: a strength-based recommender system and personal reflective journaling informatics. The HCI model assumes that eudaimonic growth can occur when both systems are in action.

Keywords *Serious leisure, Eudaimonia, Positive psychology, eTourism, Positive design*

Background

In search of well-being and authenticity
Recent years have seen increased interest in the investigation of well-being as a fundamental prerequisite for individuals, communities, and society to thrive. Currently, the field of positive psychology (PP; Seligman & Csikszentmihalyi, 2000) recognizes two aspects of well-being: hedonia and eudaimonia (Ryan & Deci, 2001). Hedonia refers to the attainment of well-being through the pursuit of pleasure, enjoyment, and instant gratification. It can be measured by the presence of a positive affect, the absence of a negative affect, and satisfaction with one's life. Eudaimonia refers to living a virtuous life, as described by the Aristotelian ideals in Nichomachean Ethics (Aristotle, 2009). Eudaimonia is considered to be a process of self-actualization through the sustained pursuit of a meaningful life and the actualization of the individual's true potential and virtues throughout the lifespan (Ryan & Deci, 2001). Although the activities that pertain to hedonia and

eudaimonia are somewhat similar, differences can be observed: some activities can give rise to both eudaimonia and hedonia, and others give rise only to hedonia (Ryan & Deci, 2001). Eudaimonia is believed to be multi-dimensional and motivated by something deeper than sheer enjoyment; it refers to authentic self-realization and self-growth (Huta & Ryan, 2010; Waterman, Schwartz, & Conti, 2008, p. 73); the fulfillment of one's innate need for autonomy, competence, and relatedness (Ryan & Deci, 2000); psychological well-being (Ryff, 1989); a happy and engaging life filled with empathy and purpose (Seligman, 2002); and the cultivation of individual character strengths for the development of individual potential (Peterson & Seligman, 2004). Last but not least, eudaimonia has also been regarded as a perpetual pursuit rather than a momentary experience. Research on the self-concordance theory (Sheldon & Kasser, 1995, 1998) has suggested that pursuing activities that are congruent with one's personal interests and which fulfill one's innate need for autonomy, competence, and relatedness can lead

the way to a life that is characterized by eudaimonia.

Authentic self and life fulfillment in tourism and leisure studies

Similarly, the quest for an authentic self and life fulfillment are strongly debatable concepts in tourism studies (e.g., E. Cohen, 2012). Initiated by MacCannell's concept of staged authenticity (1976), the notion of authenticity in tourism had been critically scrutinized from various worldviews, including objectivism, constructivism, and existentialism. While the objectivist asserts that authenticity is an inherent quality of toured objects, the constructivist argues that authenticity emerges as a result of a socially constructed interpretation of the genuineness of the toured objects. The discourse on existential authenticity is based on Heidegger's phenomenology of the concept of Dasein (Steiner & Reisinger, 2006), or the unique human capability to question and take responsibility for ones' own existential condition in the world. From this perspective, life has no predefined pattern nor destiny, and one can choose to live an authentic life in an awareness of infinite possibilities, or to live an inauthentic subdued life under the shadow of others. As tourism allows individuals to put aside their routine duties and obligations while away from home, it provides unique opportunities for individuals to reflect on their own identities (N. Wang, 1999), to live in accordance with their authentic selves (Brown, 2013), and to experience self-transformation (Reisinger, 2013a) through travel activities. Nonetheless, well-being research in tourism studies has mainly focused on hedonia (Filep, 2012; Nawijn & Veenhoven, 2012) and physical wellness (Chen & Petrick, 2013). Discourses on existential authenticity encourage the examination of travelers' activities and experiences from a eudaimonic well-being perspective (e.g., Filep, 2009; Kler & Tribe, 2012; Reisinger, 2013b; Voigt, Howat, & Brown, 2010).

Similar to tourism, leisure is considered to be an "uncoerced, contextually framed activity engaged in during free time, which people want to do and, using their abilities and resources, actually do in either a satisfying or fulfilling way (or both)" (Stebbins, 2011, p. 4). The serious leisure perspective (SLP; Stebbins, 2007) identifies three forms of leisure: casual leisure (CL), which is regarded as an intrinsically rewarding activity requiring little or no special training to enjoy; project-based leisure (PBL), which is infrequent or a

one-off moderately complicated leisure activity carried out in free time; and serious leisure (SL), which is defined as the "systematic pursuit of an amateur, hobbyist, or volunteer activity sufficiently substantial, interesting, and fulfilling for participant to find a (leisure) career there in acquiring and expressing a combination of its special skills, knowledge, and experience" (Stebbins & Elkington, 2014, p. 4). Stebbins (1982) identified six significant characteristics (Table 1) that pertain to SL. Additionally, the autotelic nature of leisure activity is compatible with the self-concordance theory (Sheldon & Kasser, 1995, 1998), as previously mentioned. While CL could stem from a hedonic motivation, the pursuit of PBL and SL are likely to be eudaimonically motivated via the gain in positive emotion and meaning; increased sense of mastery, accomplishment, and personal growth; the development of altruism; and strengthened active engagement and positive relationships (S. A. Cohen, 2013; Stebbins, 1997, 2015).

With their common goal of eudaimonia, this study connects two bodies of knowledge: the strength-based PP values in action (VIA) approach (Peterson & Seligman, 2004) and the commitment-centric approach of SLP (Stebbins & Elkington, 2014). VIA consists of six universally prominent virtues and 24 related behavior-based character strengths (Table 2) that are considered to be pathways to human flourishing. By using VIA, we can effectively deconstruct and identify the meaning and function of the individual character strengths associated with serious leisure pursuits.

Design and technology supporting the development of human potential

Technology is now omnipresent and thoroughly integrated into our lives: it enables us to work, play, and express ourselves in such a way that we no longer "use" technology but rather it has become a part of our everyday existence. In other words, technology now has the capacity to redefine and transform us (Sellen, Rogers, Harper, & Rodden, 2009). Traveler experience is no exception, as travelers often interact with different information and communication technologies (ICTs) throughout various stages of their journeys (Benckendorff, Sheldon, & Fesenmaier, 2014). The criteria for evaluating ICT solutions, such as websites and mobile apps, are primarily based on their performance and usability metrics: information quality, ease of use, responsiveness, effectiveness,

Table 1. Textile triads 1, 2, and 3.

Serious leisure – six common characteristics	
Quality	**Descriptor**
Perseverance	The occasional need to persevere amidst adversity
Leisure career	Career-like pursuits shaped by one's own histories of turning points, stage of achievement, and background contingencies
Significant effort	Exertion of significant personal effort to obtain and develop special knowledge, skill, or ability
Durable outcome	Enrichment, self-actualizing, self-gratification, group accomplishment etc.
Unique ethos	Existence of distinguishing, ideals, values, or guiding beliefs that are shared by members of the serious leisure social world
Identification with pursuit	**Strong identification of the participant with the chosen pursuit**

efficiency, and the like (Buhalis, Leung, & Law, 2011; Y. A. Park & Gretzel, 2007). Furthermore, most studies have been mainly driven by the use of technology by businesses and management, including consumer demand, technological innovation, and industry functions (Buhalis & Law, 2008). Recent research (McCabe, Sharples, & Foster, 2012) has suggested that the ubiquitousness of technology can be used to create meaningful traveler experiences and individual empowerment. In addition, research in user experience design (Harrison, Tatar, & Sengers, 2007; Hassenzahl, 2013) has led authors to argue that broader attention by paid to the human experience from a phenomenological standpoint. Interaction with technology is regarded "as a form of meaning making in which the artifact and its context are mutually defining and subject to multiple interpretation" (Harrison et al., 2007, p. 6). Thus, designs for technology-enabled travelers' experience must take into account the dynamic use context, the social situation, and users' emotions and interests, as well as the underlying motives behind their activities. More than a technology push, in this study, we argue that experience design has the potential to accommodate the latent aspects of that which constitutes a meaningful traveler experience (Calvo & Peters, 2014; see also Riva, Baños, Botella, Wiederhold, & Gaggioli, 2012; J. Wang, Chen, Chen, & Chen, 2011) and to foster the eudaimonic well-being of travelers.

Founded within PP, the field of human-computer interaction (HCI) and design also relates to using ICTs and design solutions to promote humanistic values that foster individual growth and social good. The concept of positive computing (PC) identifies nine determinant factors of well-being, which can be used in the context of the digital experience—positive emotions, motivation and engagement, self-awareness,

mindfulness, resilience, gratitude, empathy, compassion, and altruism (Calvo & Peters, 2014, pp. 85–86). On the other hand, the concept of positive design (PD; Desmet & Pohlmeyer, 2013) proposes a design framework with three components to promote individual well-being: pleasure, personal significance, and virtue. By consciously and strategically integrating these components in design solutions, we can ultimately stimulate and enable human flourishing.

Towards an HCI model for fostering individual eudaimonic development through cultivation of character strengths and serious leisure pursuits in the context of tourism

The goal of this study is to devise a preliminary HCI model that facilitates individual eudaimonic growth in the serious pursuit of leisure activities applicable to the eTourism platform. We explore the potential use of ICTs that can foster human flourishing through eudaimonic growth. First, we examine the role of participant character strengths that are associated with the construction of meaningful experience in serious leisure activities. Then, we identify common patterns pertaining to eudaimonic development that have emerged from various participants' serious leisure pursuits. By integrating concepts from the current literature with data collected from this study, we provide some directions for establishing the model. This pilot study addresses the following questions:

Q1. How to assess individual eudaimonic development from participants' character strengths and serious pursuit of leisure activity?

Q2. How to use ICT to better support the cultivation of individual character strengths in serious leisure

Table 2. Values in Action (VIA) Classification of Character Strengths and Virtues (Peterson & Seligman, 2004).

Values in Action (VIA) Classification of Character Strengths and Virtues			
Virtues	**Character strengths**	**Virtues**	**Character strengths**
Wisdom	**Creativity** – originality, adaptive, ingenuity; **Curiosity** – interest, novelty-seeking, exploration, openness to experience; **Judgment** – critical thinking, thinking things through, open-mined; **Love of learning** – mastering new skills & topics, systematically adding to knowledge; **Perspective** – wisdom, providing wise counsel, taking the big picture view.	Transcendence	**Appreciation of beauty & excellence** – awe, wonder, elevation; **Gratitude** – thankful for the good, expressing thanks, feeling blessed, **Hope** – optimism, future-mindedness, future orientation; **Humor** – playfulness, bringing smiles to others, lighthearted; **Spirituality** – religiousness, faith, purpose, meaning
Courage	**Bravery** – valor, not shrinking from fear, speaking up for what's right; **Perseverance** – persistence, industry, finishing what one starts; **Honesty** – authenticity, integrity; **Zest** – vitality, enthusiasm, vigor, energy, feeling alive and activated.	Temperance	**Forgiveness** – mercy, accepting others' shortcomings, giving people a second chance; **Humility** – modesty, letting one's accomplishments speak for themselves; **Prudence** – careful, cautious, not taking undue risks; **Self-regulation** – self-control, disciplined, managing impulses & emotions;
Humanity	**Love** – both loving and being loved, valuing close relations with others; **Kindness** – generosity, nurturance, care, compassion, altruism, "niceness"; **Social intelligence** – emotional intelligence, aware of the motive/feelings of self/others, knowing what makes other people tick.	Justice	**Teamwork** – citizenship, social responsibility, loyalty; **Fairness** – just, not letting feelings bias decisions about others; **Leadership** – organizing group activities, encouraging a group to get things done.

pursuits?

Q3. How the use of ICT can facilitate individual levels of commitment and performance in serious leisure pursuits?

Research methodologies
This study references both the constructivism viewpoint of phenomenology and the post-positivism viewpoint of the normative virtue ethics advocated by Aristotle's Nicomachean Ethics. We acknowledge that individual sense making and experience of serious leisure are highly contextual and are influenced by the complex and ever-changing social phenomena encountered (Gillespie & Cornish, 2010). As argued by Peterson & Seligman (2004), different people can flourish differently in their own configuration despite identical achievements. We use two models in this study: serious leisure pursuit (SLP) and strengths-based values in action development (VIA). SLP recognizes the developmental aspect of leisure pursuits and considers the transition between casual leisure, project-based leisure, and serious leisure activities as a continuum rather than as dichotomies (Shen & Yarnal, 2010). They can be described as a progression from dabbler to core devotee through six SLP characteristics (Table 1). The VIA strength-based model identifies a mix of character traits that can resonate with an individual's inner self (demon) (N. Park, Peterson, & Seligman, 2004).

Research plan and instruments
For this research, we used a questionnaire and in-depth one-on-one interviews to probe the character strengths that participants had drawn upon in their serious leisure activities during their journeys. Overall, we used two qualitative inquiry approaches: thematic analysis (Boyatzis, 1998) and interpretative phenomenological analysis (Smith & Osborn, 2007). We used the questionnaire, based on VIA, to identify themes to guide subsequent in-depth interviews. By carrying out both deductive and inductive thematic investigations, we were able to obtain valuable information during the study.

Online questionnaire
The purpose of the self-administered questionnaire was to help us to identify the signature character strengths that participants had drawn upon in their serious leisure pursuits—not to conduct quantitative and statistical analyses. From the responses to this questionnaire, we shortlisted three to seven character strengths most relevant to the participants' leisure pursuits (Niemiec, 2013). We then used these strengths to guide our thematic interviews and in the coding scheme for data analysis. The online questionnaire comprised 142 questions with 3 main parts: 1. Background and experience of the participants in serious leisure; 2. Self-reported appraisal of each participant's character strengths upon which they had drawn in their leisure pursuits; 3. Their use of ICTs at various stages of their leisure pursuits. Regarding the self-reported appraisal, each character strength was addressed in five questions or statements relating to: 1. The relevance of the character strength in contributing to their life fulfillment; 2. Self-

appreciation of the importance of the contribution of the character strength to eudaimonia; 3. The extent to which their character strength can be developed through their serious leisure pursuits; 4. The extent to which the participant must use each character strength to excel in their leisure pursuits; and 5. The extent to which practicing the serious leisure pursuit during their journey can foster the participants' character strengths. For example, the five questions related to the character strength "curiosity" are as follows:

1. To be curious is an important personal character trait that can bring me a life of meaning and fulfillment;
2. I have strong sense of curiosity;
3. The serious leisure pursuit (to be replaced with the name of the serious leisure activity in which the participant is involved) allows me to be more curious;
4. To excel in the serious leisure pursuit (to be replaced with the name of the serious leisure activity in which the participant is involved) requires me to be more curious;
5. Practicing serious leisure pursuit (to be replaced with the name of the serious leisure activity in which the participant is involved) during my journey made me more curious.

We used a five-level Likert Scale, ranging from strongly agree to strongly disagree. We then added up the five scores pertaining to each character strength and considered those character strengths that ranked higher (the topmost 3-7 character strengths, according to VIA recommendation; Niemiec, 2013) to be the participants' signature character strengths that were contributing to their serious leisure pursuits. These highlighted character strengths were emphasized and further discussed in the in-depth interviews with each participant.

Semi-structured in-depth interview guide
Based on the results of the questionnaire, we then focused on a manageable number of character strengths to be discussed in the interview. We adopted the interpretative phenomenological analysis approach in which the researcher facilitates participants' sharing of their life stories and anecdotes (Pietkiewicz & Smith, 2014). Participants were encouraged to use object and photo elicitations as means to enrich the discussions.

Sampling
In this pilot study, we expected the sample to represent the depth and breadth of the serious leisure landscape. We used heterogeneous, non-probability, and purposive samples. We consider that serious leisure can be practiced regardless of age, educational background, household composition, or profession. Furthermore, character strengths are seen to be cross-cultural (McGrath, 2015; Seligman, Steen, Park, & Peterson, 2005), which frees the sampling procedure from demographic concerns. However, the participants deemed to be suitable for this study had to fulfill two criteria: they were to be serious leisure practitioners in any of the domains identified by Stebbins (1982);

and they must have practiced their SL, either partially or entirely, in one or more of their journeys. Below, we identify six broad SL domains and offer a few examples:

1. Art and culture: language and culture, culinary arts, painting, photography;
2. Sports: scuba diving, yachting, mountaineering, running marathons, rock climbing;
3. Natural sciences: amateur cosmologist, amateur radio enthusiast, organic farming;
4. Entertainment: magic, drama, singing, performance dance;
5. Volunteering: education, first aid, humanistic work, environmental protection;
6. Spirituality: yoga, meditation, pilgrimage, spiritual practice.

We recruited participants using convenient and snowball sampling methods through various social networks to connect with different SL communities. We introduced ourselves through email or telephone to potential participants to communicate the project objectives. We invited a total of seven people to participate in this study, each of whom participated in a different SL genre with various degrees of commitment. All participants were of Chinese ethnicity, and lived and worked in Hong Kong at the time of the interview. Table 3 lists the participants' backgrounds, SL activities, experience, and a personal statement on their SL pursuits.

Data collection, coding scheme
We conducted interviews in the native (Cantonese) language of the participants so that they could freely express their views without any language constraints. The interviews began with a self-introduction by the participants and their experience in SL, followed by thematic discussions based on the list of character strengths highlighted in their responses to the online questionnaire. The duration of each interview was around 90 minutes and the interview sessions were audio recorded, translated, and then transcribed into

English edited text for further data analysis. A research assistant helped in the transcription and coding process, during which the coding scheme and coding procedure was discussed. We used the VIA (Table 2) and SL characteristics (Table 1) as references in the coding scheme. We performed the coding using QSR NVivo software, and applied the codes to the sentences and paragraphs of the transcript.

Visual representation of data analysis
In addition to coding, visualization is another means for understanding the dynamics of the participants' character strengths that interplay with their SL activities and their attributed meaning. We used a thematic map (Braun & Clarke, 2006) and the actor network theory (ANT; Latour, 1999) to examine the connections between human and non-human entities. From the ANT perspective, the "actor" can be literally anything as long as it is regarded as the source of action and has the capability to influence other "actor(s)". A "network" is generated by connecting different actors. Meaning emerges as a result of the interplay between networked actors with respect to subject, objects, social networks, environment, situations, interactions, and emotions. The ANT map illustrates the complexity of eudaimonic development. We also use a swim lane diagram to illustrate how SL activities are associated with participants' development of SL pursuits over time.

Results

Background of the participants
Here, we provide a brief introduction to the participants' backgrounds to better convey their ideas of eudaimonia with respect to their serious leisure pursuits. To preserve privacy, all identifying information has been changed.

Emily, a new environmental science graduate, loves to be in contact with nature. Hiking, planting, and identifying insect species are her preferred activities that connect her with her passion and reflect the

Table 3. List of participants, background, and personal statement on their serious leisure pursuits.

List of participant, background, and personal statement on their serious leisure pursuits

Pseudonym[1]	Domain	Activity	Experience (year)	Statement[2]
Emily	Natural science	WWOOF[3]	1	To experience beauty and harmony in organic farming with friends.
Kelly	Entertainment	Swing dance	7	Swing dancing gives me a vibrant life.
Sofia	Art & Culture	Documentary photography	10	Capturing the authenticity of other cultures helps me to reflect on my identity.
Shane	Sport	Rock climbing	8	Be humble, there are always higher "mountains" ahead.
Evan	Sport	Dinghy racing	13	Dinghy racing connects me to the flow of life.
Orion	Spirituality	Theravada meditation	7	Meditation makes a better version of me.
Andy	Volunteer	Volunteer on education project	7	**We work for equal learning opportunity, and it is through learning that more opportunities can be provided to everyone.**

[1] *Name and details of the participants are changed to preserve confidentiality.*

[2] *Statements were formulated based on the data collected in the interview.*

[3] *WWOOF refers to World Wide Opportunities on Organic Farms, a networks of organizations that facilitate overseas' work placements on organic farming.*

beauty and harmony of nature. Recently, she launched herself as a WWOOFer (World Wide Opportunities on Organic Farms) and has toured overseas with friends to further explore the wonders of nature. Considering it as a once-in-a-lifetime experience, she was curious about what WWOOFing would offer. Strictly defined, her case can be considered as project-based leisure (Stebbins, 2011), which may have the potential to transform into a sustained pursuit.

Sofia's passion for documentary photography is closely connected with tourism. Through the camera lens, she enjoys capturing the authentic everyday lives of people in other cultures. Travelling away from home allows her to reflect on her personal identity while putting her daily routine aside. The curiosity she has about other cultures creates an introspective space in which she finds herself better able to appreciate the cultural diversities of other societies.

Kelly is a performance artist. She became interested in swing dance during an overseas tour. She likes to dance for a number of reasons: the funky jazz music, the freedom of bodily movement and expression, the stylish dress code of the 1950s, and the welcoming community. Soon after learning to dance, she became an active member in the dance community, attending overseas competitions and workshops. She also hopes to introduce dance in her local community through workshops and gatherings.

Shane met her husband in the rock climbing community. Their romance developed, not through mass tourism experiences, but at various rock climbing sites around the globe. Recently, they spent a year touring around Europe with a focus on experiencing different natural rock formations. Climbing has made Shane more humble and self-controlled when facing the challenges of an ever-changing natural environment.

Evan launched herself into dinghy racing endeavors. Her determination and skill has brought her to the point of being a candidate in world championships. Pursuing performance, mastery, and direct contact with the ocean has made her totally devoted to these pursuits. Fulfillment has come through her bravery and perseverance. This immersive sporting experience captivated her despite the routine and tough physical training in adverse conditions.

While SL is obviously associated with sport endeavors, Orion decided to pursue another extreme by becoming a serious practitioner of meditation. Instead of pursuing hedonic enjoyment, she was determined to find more sustained fulfillment through this practice. She has found honesty and self-acceptance to be the essence of wisdom. Prolonged meditation retreats, which can last from 10 days to months, has led to experiences of both epiphany as well as misery.

Andy was invited by his friends to initiate a charity project when he was an undergraduate student. The group started to build primary schools in rural areas of Cambodia. He became devoted to the project and, in subsequent years, built a few schools in Cambodian

villages with more and more volunteers joining every year. For him, gratitude and learning characterize this project in every sense of the word. While the group builds places for learning, Andy finds that he himself learns a lot from these building projects.

Despite the diverse backgrounds, motives and goals of the participants, their activities qualify as falling within the constellation of serious leisure pursuits, as noted by Stebbins (1982), through various combinations of character strengths. Some commonalities can be identified: 1. The pursuit of serious leisure can be appreciated from both cross-sectional and developmental perspectives; 2. Individual satisfaction and fulfillment can be achieved through exercising one's character strengths, in addition to performing the activity itself; 3. Goal formulation, reflection, and introspection are important aspects of building meaningful experiences.

Cultivation of character strengths in the context of serious leisure pursuits
Through in-depth interviews, we further examined details associated with these SL pursuits. We used the stories and anecdotes recounted by participants as well as the relevant codes as references to support the three key findings noted above.

1. Appreciation of serious leisure from cross-sectional and developmental perspectives
The practice of any form of serious leisure requires more than one character strength. As such, this study does not attempt to make generalizations about how to pair the character strengths of any leisure activity. As described by SLP and VIA, eudaimonia is the result of a sustained commitment and cultivation of character strengths in autotelic activities. The stories shared by the participants reveal eudaimonia to be a dynamic concept that can be viewed from both synchronic (cross-sectional) and diachronic (developmental) perspectives.

As an example, we can use the swing dancing that Kelly performs to illustrate these two perspectives. With reference to the coded transcript matching within the VIA framework, we can identify four dominant character strengths, using the coding reference number of the transcript shown in the brackets: social intelligence (18), kindness (11), zest (9), and love of learning (7). From the synchronic perspective (Figure 1), swing dancing is composed of an array of interlinked activities, whereas dance performance is only one aspect of this pursuit. Social intelligence is the character strength most strongly connected with the activities related to her dance performance.

In addition to the cross-sectional aspects, Kelly's swing dance pursuits can also be appreciated from a developmental perspective (Figure 2). Her 7-year pursuit of swing dance has been marked by numerous memorable and personally significant achievements and milestones: regular gatherings, intensive workshops, meetings with like-minded people, festivals, winning a championship in a dancing contest, and promoting dance to others. These
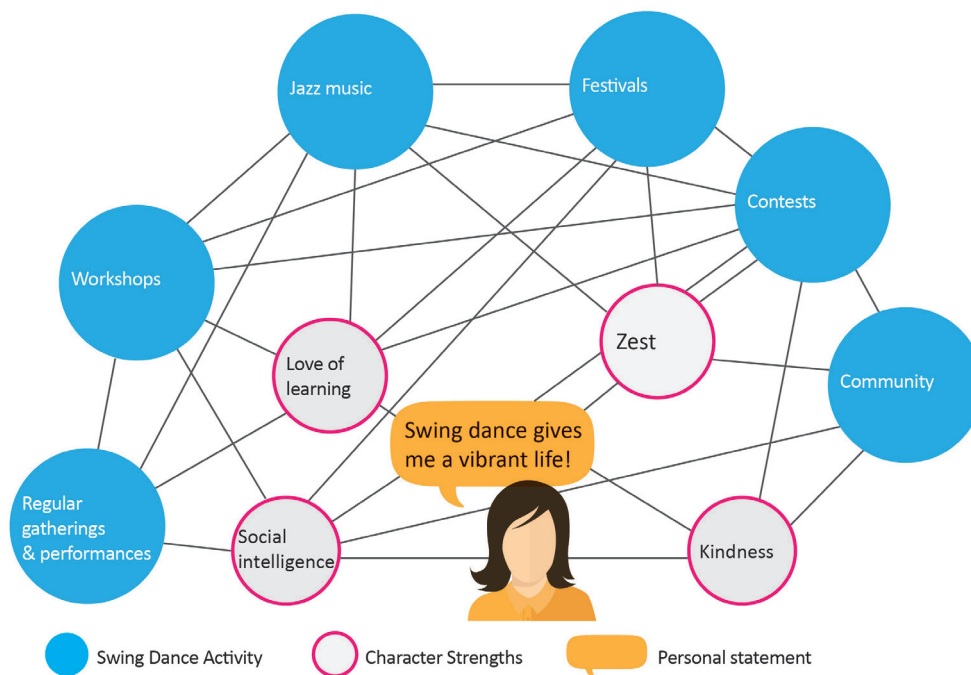
Figure 1. ANT diagram of Kelly's character strengths related to her swing dance pursuits from a cross-sectional perspective.

achievements can be viewed with respect to the six defined SLP characteristics involving the incremental acquisition of knowledge, skill, and experience, and sustained personal effort (Stebbins, 1982). Appreciating eudaimonic development from the cross-sectional and development perspectives is important with respect to technology because technology, such as personal informatics (Li, 2011), has become an integral part of everyday life. While current informatics systems focus on aggregating bio-signals, we propose an informatics system that focuses on the development of individual character strengths over time.

2. Pursuing serious leisure involves more than performance; satisfaction and fulfillment can be achieved through exercising individual character strengths
According to the SLP concept, pursuing serious leisure is primarily focused on excelling in contextually framed activities through an accumulation of individual skills, knowledge, and experience through persistent effort. However, in this paper, we argue that serious leisure pursuit involves more than just performance (e.g., Scott & Godbey, 1994). For example, one of the important things Shane has learned from her rock climbing pursuit is personal humility--balancing personal performance with the demands of the immediate environment, especially when confronting adverse weather conditions:

"For me, climbing is not about excitement… It is about humility. First, you cannot climb when it is a rainy day. The climbing community is very international and there are always many outstanding climbers around." Wan, B. (Interviewer) & Shane (Interviewee). (2015). In-depth interview - Flourishing through travel [Interview transcript].

Besides performance and self-identity, the quest for an authentic self is also an important aspect of serious leisure pursuit. Orion's motivation for pursuing meditation is the journey to find her genuine self:
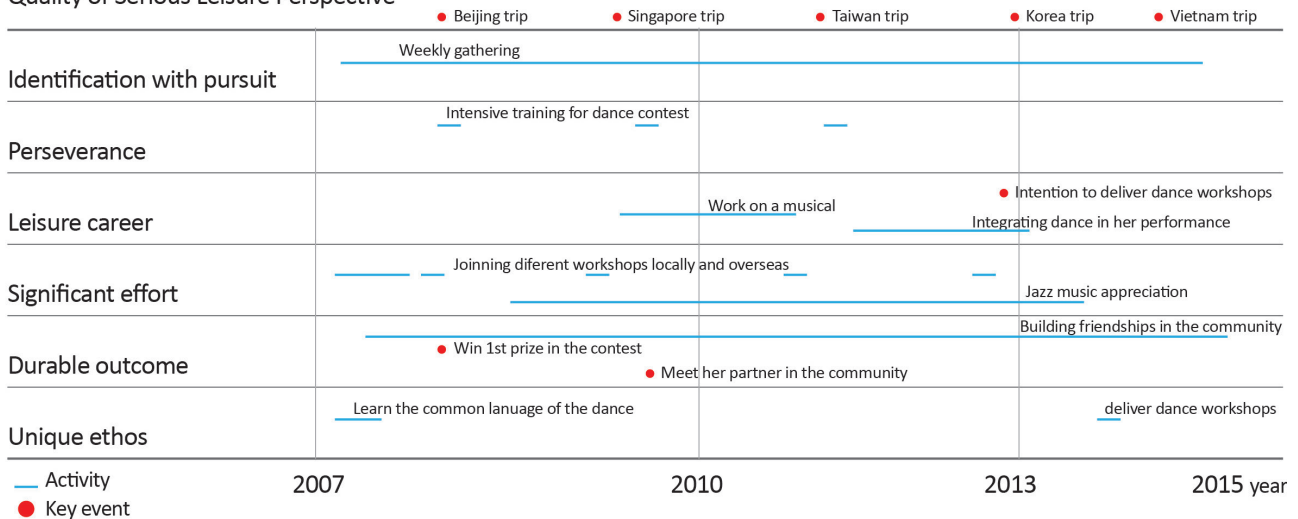
"The more you are involved in [meditation] practice, the more you gain insight into yourself… I was intrigued and curious to know more about myself." Wan, B. (Interviewer) & Orion (Interviewee). (2015). In-depth interview - Flourishing through travel [Interview transcript].

The in-depth interviews with participants showed that serious leisure is a complex phenomenon. With reference to the six SLP characteristics (Stebbins, 1982), SL seems able to address the identification and development of self-identity (Goffman, 1959). Using the VIA model, we can identify the intrinsic qualities of the authentic self—the implicit quality of eudaimonia.

3. Goal formulation and introspection are peculiar to serious leisure pursuit
The results of this research suggest that formulating and pursuing self-concordant goals that are compatible with personal signature character strengths can foster one's eudaimonic growth (e.g., Sheldon & Kasser, 1995). One example is that by participating in WWOOFing activities, Emily found that they resonated with her love of learning. Evan found that once she had established numerous goals, they brought her both positive and negative experiences. She has found her 13-year pursuit of dinghy racing to bring her into the flow of life, even though it has not become her career, as she had once expected. Perseverance, zest, and bravery are the character strengths that connect her with her growth-goal.

Quality of Serious Leisure Perspective

● Beijing trip   ● Singapore trip   ● Taiwan trip   ● Korea trip   ● Vietnam trip

Identification with pursuit
Weekly gathering

Perseverance
Intensive training for dance contest

Leisure career
Work on a musical
● Intention to deliver dance workshops
Integrating dance in her performance

Significant effort
Joinning diferent workshops locally and overseas
Jazz music appreciation

Durable outcome
Building friendships in the community
● Win 1st prize in the contest
● Meet her partner in the community

Unique ethos
Learn the common lanuage of the dance
deliver dance workshops

— Activity
● Key event

2007   2010   2013   2015 year

Journey map shows Kelly's commitment to Swing Dance in terms of SLP (developmental perspective)

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Figure 2. Swim lane diagram illustrating Kelly's commitment to swing dance as an SLP, from a developmental perspective.

Another common aspect of participants in SL pursuits is their capacity for reflection and introspection with respect to their goal attainment. Andy's 7-year experience as a volunteer in school building projects in Cambodia has caused him to seriously reflect on his actions:

"After years of field work, we [the team] always reflect on the rationale behind our activities; what is the purpose of our field work? Is it to show our achievements to others? Or to make ourselves experts in school building? Are we actually doing 'good' for the local people?"

"A recent article I read was about an orphanage visit that turned into a lucrative business opportunity for local tour agencies… we keep learning what's happening out there and constantly reflect on our own practices." Wan, B. (Interviewer) & Andy (Interviewee). (2015). In-depth interview - Flourishing through travel [Interview transcript].

Introspection about the goal attained in connection with the participants' life purpose is also a common theme in SL pursuits. Andy's introspective thoughts about his volunteer work is about more than his self-identity or his initial expectations:

"On many occasions, I have seen sincerity, authenticity, and gratitude through their [people in Cambodia] eyes and actions… that is one of the reasons that keeps me involved in this project. After years of experience, it [the charity work] is no longer a serious leisure pursuit, it has become a mission—an inner calling urged me to return to Cambodia to work on another project." Wan, B. (Interviewer) & Andy (Interviewee). (2015). In-depth interview - Flourishing through travel [Interview transcript].

The results of this study revealed that individual eudaimonic growth through serious leisure pursuits involves individual signature character strengths. By combining our research findings with concepts in the current literature, we propose a tentative interactive model for promoting and enabling individual character strengths and potentials through serious leisure activities.

Discussion—toward an HCI model for eudaimonic growth

The proposed HCI model (Figure 3) contains two interrelated components: a goal formulation and strength-based recommender system (SBRS; Ricci, Rokach, Shapira, & Kantor, 2011) and a journaling and personal informatics system (JPIS; Li, Dey, & Forlizzi, 2011). These two components coincide with recent findings in eudaimonic development, wherein researchers (Bauer, McAdams, & Pals, 2006; Bauer, Park, Montoya, & Wayment, 2014) have identified two facets of growth motivation: experiential and reflective. The former supports the deepening or strengthening of individual experience and relationships through skill and knowledge building; the latter focuses on the individual's conceptual learning and gaining of new perspectives on one's psychosocial life.

Based on our research results, we hypothesize that eudaimonic growth happens when goal setting and strength building harmonize with reflection and introspection behaviors through journaling. In contrast to personal informatics that focuses on the collection and analysis of bio-signals (Li, Medynskiy, Froehlich, & Larsen, 2012), we propose new considerations that can support eudaimonic well-being in the current technology-enabled culture: First, we suggest the relevance of a strength-based recommender system to facilitate the formulation of growth-goals that specifically address the information overload that occurs over cyberspace. Second, we suggest the use of ICTs for technology-mediated introspection. Reflection and introspection allow individuals to critically reflect on their behavior, by "bringing unconscious aspects of experience to

Design for eudaimonic growth

HCI model that fosters one's eudaimonic growth through cultivation of character strengths in serious leisure pursuits

Goal setting

Strength-based Recommender system (SBRS) for experiential growth

Serious leisure activities that can cultivate one's positive character strengths development for eudaimonic growth

Strength building

Cross-sectional approach to character strengths cultivation through goal setting and goal attainment

Journaling

Journaling and Personal informatics system (JPIS) based on user's digital footprint for reflective growth

Reflection & Introspection

Developmental approach to serious leisure development through reflection and introspection
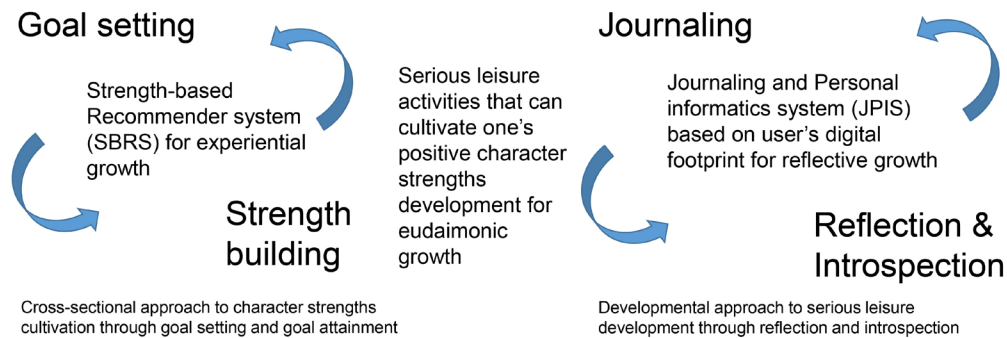
Figure 3. Tentative HCI model for the fostering of individual eudaimonic growth through the cultivation of character strengths in serious leisure pursuits.

conscious awareness, thereby making them available for conscious choice" (Sengers, Boehner, David, & Kaye, 2005, p. 50). Reflection is not simply an end, but rather it can be integrated into the developmental process to enable eudaimonic growth. Currently, usability and effectiveness remain the main frames of reference for conceptualizing and measuring ICT solutions for tourism and leisure. Here, we call for greater attention to be given to travelers' motives, their core character strengths, and personal reflection as the building blocks of meaningful experience, and which can be integrated into the design of technology-enabled tourist experiences. Further field research through participatory design and prototyping is necessary to explore and validate appropriate design criteria and principles related to the proposed model. Lastly, we acknowledge the limitations of this research. First, the use of more homogenous samples and a larger sample size would better identify existing behavior and strength patterns in SL pursuits. The proposed model suggests the "how" with respect to technology but does not propose the "what" features that can foster eudaimonic growth. Second, a more formalized interview approach and coding procedures should be adopted. Third, the results of this pilot study do not provide sufficient grounds for establishing an HCI model. In-depth studies of the implementation of such a system are needed to verify the merits of this proposal.

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