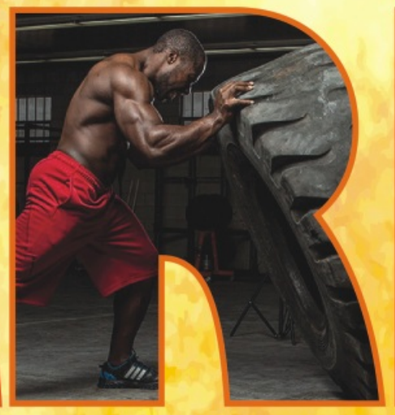
HONG KONG RECREATION REVIEW
康樂動向

Volume 31
2019
二〇一九年
第三十一期



Hong Kong Recreation Management Association
香港康樂管理協會

Hong Kong Recreation Management Association
香 港 康 樂 管 理 協 會

2018 - 19 Organisation and Office Bearers
二〇一八至一九年度組織及職員表

Patron 贊助人	霍震霆 GBS, 太平紳士 *The Honourable Timothy Fok Tsun Ting, GBS, JP*
Hon. President 名譽會長	林建名博士 *Dr. Lam Kin Ming*
President 會長	容德根博士 *Dr. Dicken Yung*
Hon. Legal Adviser 名譽法律顧問	王寶榮大律師 *Mr. Wong Po Wing, Barrister*

Executive Committee 執行委員會

Chairman 主席	胡偉民先生 BBS *Mr. Johnny Woo Wai Man, BBS*
Vice Chairman 副主席	張國基先生 *Mr. Paul Cheung Kwok Kee*
Secretary 秘書	黃達明先生 *Mr. Richard Wong Tat Ming*
Treasurer 司庫	黃令陶先生 *Mr. Lester Huang Ling To*
Member 委員	陳敏璇女士 *Ms Joyce Chan*
	鄺文龍先生 *Mr. Arthur Kwong Man Lung*
	林絢琛博士 *Dr. Michael Lam Huen Sum*
	劉永松教授 *Prof. Patrick Lau Wing Chung*
	梁景法先生 *Mr. Kelvin Leung King Fat*
	李世琛博士 *Dr. Sam Li Sai Sum*
	屈旨盈小姐 *Miss Crystal Vut Tsz Ying*
	黃嘉儀博士 *Dr. Allison Wong Ka Yee*

Sub-committees 小組委員會

Academic 學術小組	劉永松教授 *Prof. Patrick Lau Wing Chung*
	林絢琛博士 *Dr. Michael Lam Huen Sum*
	陳敏璇女士 *Ms Joyce Chan*
	鄭浩杰先生 *Mr. Calvin Cheng Ho Kit*
Marketing 市場推廣小組	鄺文龍先生 *Mr. Arthur Kwong Man Lung*
	黃啟雄先生 *Mr. Patrick Wong Kai Hung*
	屈旨盈小姐 *Miss Crystal Vut Tsz Ying*
	鄭浩杰先生 *Mr. Calvin Cheng Ho Kit*
Membership 會員小組	黃嘉儀博士 *Dr. Allison Wong Ka Yee*
	陳愷晴小姐 *Miss Chan Hoi Ching*
	游家騰先生 *Mr. Yau Ka Tang*
Newsletter 會訊編輯小組	李世琛博士 *Dr. Sam Li Sai Sum*
	何詠嘉小姐 *Miss Ho Wing Ka*
	余顯穎小姐 *Miss Yue Hin Wing*
	王詩韻小姐 *Miss Muse Wong*
Social and Recreation 社交及康樂小組	梁景法先生 *Mr. Kelvin Leung King Fat*
	屈旨盈小姐 *Miss Crystal Vut Tsz Ying*
	黃曉盈小姐 *Miss Angel Wong Hiu Ying*
Finance	黃令陶先生 *Mr. Lester Huang Ling To*
	林思源先生 *Mr. Lam Sze Yuen*

CONTENTS 目錄

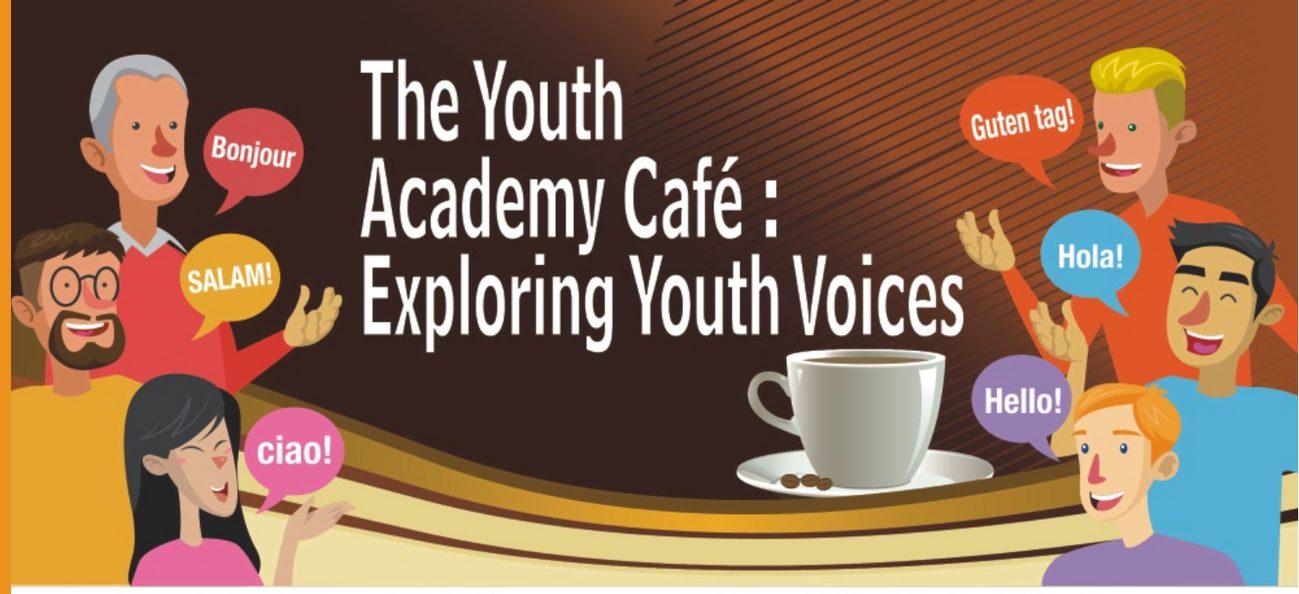
康樂動向
二〇一九年
第三十一期

Hong Kong Recreation Review
Volume 31
2019

康樂動向是香港康樂管理協會出版的刊物。本刊登載的文章，所表達的意見，並不一定代表康樂管理協會的意見。

有關本刊物的任何查詢，可致函香港郵政總局郵政信箱9044號香港康樂管理協會。本會網址：http://www.hkrma.com.hk

Hong Kong Recreation Review is a publication of the Hong Kong Recreation Management Association. The opinions expressed in the articles are the contributors' own and do not necessarily reflect the views of the Hong Kong Recreation Management Association. Correspondence address: Hong Kong Recreation Management Association, P.O. Box 9044, General Post Office, Hong Kong. Website: http://www.hkrma.com.hk



The Youth Academy Café : Exploring Youth Voices

Christopher R. Edginton **R.J. McElroy**
Department of Health, Recreation and Community Services
University of Northern Iowa

Abubakarr Jalloh **Theodora Jn Baptiste**
Michelle Cook **Susan Burton**
Marie Elomba **Younis Al Hassan**
Institute for Youth Leaders
University of Northern Iowa

Introduction

Today's youth represent a significant portion of the world's population. This is especially true in developing countries, where the population of young people has exploded. As the United Nations Secretary-General, Ban Ki-moon, observes, "Today we have the largest generation of young people the world has ever known" (Jalloh, 2012, p.190). Such youth, according to Edginton, Kowalski, and Randall (2005, p.1), represent the hopes and aspirations for the future. This view is echoed by the United Nations former Under-Secretary-General, Jose Antonio Ocampo, noting that "… young people hold the key to society's future" (United Nations Department of Economic and Social Affairs, 2005, p. iii). Listening to and understanding the aspirations and expectations of youth is of great importance to youth workers. By listening and hearing the voices of youth, insights are gained which lead to greater acceptance and understanding of today's youth culture.

Who are today's youth? Although there may be a common understanding of who is youth within the context of age, a diverse age-range is used to define youth. Such an age-based definition of youth reflect a society's cultural underpinning and public policy orientation. In essence, the definition of youth in term of age varies a great deal between countries. As Jalloh and Jn Baptiste (2014) observe, "Other terms often affiliated with youth include, teen, teenager, adolescent, and young people. The term "adolescence", for example, is often used in the United States of America to describe this age grouping. This term was coined by the famous American psychologist, G. Stanley Hall, in 1904 in his famous two volume works entitled, Adolescence (p. 145).

While the United Nations (UN) defines youth as someone between the ages of 15 to 24 years old (United Nations Educational, Scientific, and Cultural Education, n.d.), many countries and regions of the world have a different definition, which will also fall within the UN definition. First, the African Union (2009) defines youth as someone between the ages of 15 to 35 years old. Interestingly, Europe has a wide range of ages that defines who is youth. For example, "in the Netherlands, children and youth represent anyone between the ages of 0 and 20 years old, France defines youth as those 3 – 30 years old and in Estonia youth refers to an individual who is between 7 to 26 years old" (Jalloh, 2015, p. 161). Moreover, while in the Philippines youth represents those who are 15-30 years old, and in Thailand the age ranges from 15-25 years old (Brown, Larson, & Saraswathi, 2002). These, among numerous country-specific definitions, suggest the arbitrary nature of defining childhood and youth. This may largely be attributed to the reality that childhood and youth concepts are culturally-defined social constructs (Jalloh, 2015). Despite this diversity of youth definition, most international endeavours on youth issues seem to follow or use the UN definition in addition to taking into account their own local context.

Why do we need to hear the voice of our youth? Youth should have the opportunity to contribute in meaningful ways to the dialogue and conversation that impact their lives. Their voices are legitimate and need to be heard and understood. The idea of thinking together and making meaning reflects the notion of active and constructive engagement. By hearing the voices of youth, it is also a way of involving them in actively participating in their community. It is important for youth to engage in collaborative inquiry and the co-creation of ideas and concepts. Embracing this significant population of society adds to its resource base. Sethi (2010) has offered a reflection from a youth regarding the importance of their voice. He offers the following:

> "[Youth voice] gives us a sense of responsibility and makes us rise to the occasion and really start leading. I've also seen situations where adults take too much power… and then we just turn into the followers and we really don't do anything" (Sethi, 2010, p.1).

The purpose of this article is to report on a strategy aimed at hearing the voices of youth in a framework referred to as the Youth Academy Café. The process employed will be fully described as well as an abridged analysis of the findings.

Youth Academy Café

The Youth Academy Café is a program of the University of Northern Iowa's Institute for Youth Leaders whose mission is to provide leadership in research, development, and the diffusion of knowledge to the youth development profession. The design, organization, and activities of the Institute are built on the concept of collaboration. Resources from the University and local community youth serving organizations are joined in a model partnership to creatively address the needs of youth professionals for education in leadership, youth development, and management.

The Youth Academy Café fostered an interactive dialogue among and between young people and community members and drew its inspiration from a process-oriented methodology known as The World Café. This methodology is a straight forward, flexible format for promoting dialogue and conversation. This process involves discovering common interests, sharing knowledge, imagining the future, and cooperating to survive and thrive" (The World Café, 2015). This methodology offers a way for cross pollination of ideas and relationship building as the participants move from one conversation to another, creating and exploring topics together.

In this setting, facilitators and young people were all encouraged to actively contribute to the conversation and to share their ideas and perspectives. By including youth in the conversation, the questions and topics became even more significant. Engaging youth in this process generates useful knowledge for community youth leaders and "provides opportunities for the development and empowerment of youth participants, leading to benefits for young people, organizations, the broader community and the research process" (Powers & Tiffany, 2006, p. 79). The facilitator encouraged a format which included an initial introduction of the participants,

followed by expediting the process of constructive dialogue in three twenty minute sessions where each small group interacted with different groups in an effort to encourage multiple perspectives on the designated topics of inquiry. The community reconvened as a whole unit to establish any patterns of insight and creativity. With the strategy of designing an event to explore and hear youth voices and viewpoints, the Youth Academy Café was arranged to explore topics related to youth, create transformative processes and develop possible research actions that could be pursued.

The World Café methodology is built upon seven basic design principles. These include: (1) setting the context; (2) creating hospitable space; (3) exploring questions that matter; (4) encouraging everyone's contribution; (5) connecting diverse perspective; (6) listening together for patterns and insights; and (7) sharing collective discoveries (World Café, 2015). Of importance of the application of The World Café methodology to the Youth Academy Café was creating an environment conducive to a conversation. A relaxed setting was created with tables and chairs arranged for conversation. The number of chairs at each table was limited to no more than 6. The environment crafted was similar to a coffee house/café with coffee, tea, water, soft drinks, and cookies available to the participants. Following a welcome and introduction, small group rounds of 15 to 20 minutes of conversation was implemented. Each table was offered a set of question to focus and stimulate the conversation. Each of the group/station discussions were recorded. Following the discussion rounds, the group/station facilitator reported out comments. These were then graphically record at the front of the room to generate both verbal and visual meaning to the concepts offered.

Forty-five (45) young people joined with 10 community members to participate in the event. Of the youth participants ages ranged from 19 to 26 years old, with a mean age of 22.3. Thirty-two (32) percent of the participants were females and 14% were males. Seven participants were identified as individuals of color. An overall program facilitator was engaged, whose role was one of introducing group/station facilitators and drawing comments from the groups at the end of the session. The facilitator explained the process and agenda at the beginning of the event. This individual has had extensive experience implementing the World Café format. She also serves as the executive director of the area's largest foundation and holds advanced degrees at the masters and doctoral levels. The individuals serving as group facilitators were drawn from several different types of agencies including businesses, government, faith-based organizations, and the university community. Of the six group facilitators, four were males and two were females. Five of the group facilitators were individuals of color. All had extensive experience working with youth professionally or as a volunteer. The group facilitators were responsible for initially moving the discussion forward and ensuring that the comments were recorded. The group facilitators served to draw out and amplify the expressed views of youth. Their role was one of engaging the youth participants to openly share their views in a non-judgmental and supportive environment. They were also responsible for summarizing various conversations and reporting back to the group as a whole.

Some of the key features of the Youth Academy Café included:

- Rotation of participants to various stations
- A communication process wherein facilitators were knowledgeable, familiar, and available to coordinate discussion topics
- A process of free engagement, wherein everyone's contributions were encouraged
- Questions were structured in an open-ended fashion
- Individuals were encouraged to share their life experiences as a part of the discussion
- There was no over-crowding at each of the tables as to create space for conversation

Theoretical Perspectives in Exploring Youth Voices

Open ended questions were formulated as a process of inquiry which could be defined as participatory action research, where the participants were involved engaged in conversation and self-reflection. Action research is also defined as a "collaborative activity among colleagues searching for solutions to everyday, real problems experienced in a school or community" (Ferrance, 2000, p. 1).

Another theoretical perspective on the Youth Café is cooperative learning. Based on the social learning theory, cooperative learning "emphasizes the social context whereby learning results from mutual interaction and exchange of ideas among participants and offers a set of procedures that assist groups of youth to learn and act together" (Berg, Coman, & Schensul, 2009, p. 349). The Youth Academy is a good example of cooperative learning as it joined together youth leaders in the community and young adults in a process designed to explore issues facing the youth in the community. Critical questions were designed to encourage a constructive dialogue, build personal relationships and cultivate collaborative learning (Berg, Coman, & Schensul, 2009). The process involves mutual respect and conversation so each member that participates feels valued and that their opinion matters.

The Youth Academy Café is a cooperative learning process in which youth are asked to be an equitable partner to the conversation and are able to interact with leaders and other community members and other participants. The Youth Academy Café informal format and guided process is "is especially effective for enhancing higher-level thinking (information use, problem solving and decision-making), competence motivation (norms, expectancies, self-efficacy), and interpersonal skills (negotiation and consensus building)" which can also contribute to improving educational performance (Berg, Coman & Schensul, 2009). When held in a group setting such as the café format, cooperative learning is designed to facilitate positive interaction and build relationships among different social groups and networks. Every voice is important. The Youth Academy Café embraces the format with conversation as the primary vehicle through which individuals conceive the world and embrace relationships and conceive the world. Conversation is the "human way of discovering the new meanings that shape the future" (Brown & Isaacs, 2005, p .3).

Another theoretical perspective in action research is appreciative inquiry. The appreciative inquiry method of gathering information involves "serious consideration and reflection on the ultimate mystery of being engenders a reverence for life that draws the researcher to inquire beyond superficial appearances to deeper levels of the life-generating essentials and potentials of social existence" (Cooperrider & Whitney, 2005, p. 131). In the Youth Academy Café format, participants were engaged in the mode of inquiry on empowering youth and establishing methods for increasing meaning or purpose in the lives of young adults. This action research methodology is drawn to "affirm, and thereby illuminate, the factors and forces involved in organizing that serve to nourish the human spirit" (Cooperrider & Whitney, 2005). Appreciative inquiry is also a transformational mode of developing dialogue and action within a social setting focusing on a particular issue or concern; in this case, youth voices.

By involving the youth in collecting information on social issues and policy change, social capital in the community will improve. In relationship to community cohesion, social capital can be defined as the "social glue between people, organizations and communities that enables them to work together to pursue shared objectives; the social networks characterized by norms of trust and reciprocity" (Percy-Smith, 2006, p. 160). The Youth Academy Café encouraged civic engagement and reciprocity, a fundamental construct in developing social capital. The café format involving leaders in the community and youth as a social network involved interaction that broadens the "participants' sense of self," developing the individual into part of a group as a whole which strengthens collective benefits for the community (Putnam, 1995). Another note on utilizing the Youth Academy Café arrangement to strengthen social capital includes the actual setup of group discussion to develop "linkages among individuals or groups within the collectivity and, specifically, in those features that give the collectivity cohesiveness and thereby facilitate the pursuit of collective goals" (Adler & Kwon, 2002, p. 18).

Transformative Processes within the Youth Academy Café

Transformation is defined as a process of change or growth. It is a construct that implies that "one will change, alter, or even convert oneself in a marked fashion; that an individual, community, or society as a whole will change its nature, function, form, appearance, or condition" (Edginton & Chen, 2008, p.3). Florida (2002) defines today's young adults as the creative class. Their contribution to change is imperative and creating an environment where youth in the community and leaders of youth serving organizations can exchange in creative discussion offers a chance for achieving goals for improved community cohesiveness. The Youth Academy Café environment encourages the creative climate by including intellectual receptiveness, ethnic diversity and political openness; characteristics that Florida referred to as the "social structure of creativity" (p. 48).

This Youth Academy Café event has the potential to create transformational change in the community through the development of social capital. One aspect of social capital is human capital and it can be "understood to include the skills and abilities of people to develop and enhance their resources and to access outside resources and bodies of knowledge in order to increase their understanding, identify promising practices, and to access data for community-building" (Emery & Flora, 2006, p. 21). This is exciting as there is an opportunity for community based transformation that can be applied globally.

Encouraging interaction among the University population and the community is another aspect for further research in transformation. Dewey, in the 1930's, determined that constructs of school and society are intertwined arguing that "real advances in knowledge occur when educational institutions focus on those central issues facing contemporary society" (Arches, 1997, p. 36). Paulo Freire's *conscientiazacao* is a term defined as conscious raising. This concept is applicable to the Institute for Youth Leaders in that it refers to "the developmental processes in which an individual moves from magical to naive to critical social consciousness" (Smith, 1976). These scholars contribute to the theoretical framework behind transformation and the Institute for Youth Leaders. The ideology of listening to youth voices and forging relationships with community members and leaders is a transformative process that can be applied locally and globally. In the naturalistic setting of the Youth Academy Café, conversation is the medium through which "breakthrough thinking and collective action emerge" to encourage societal learning and a depth of new information that did not previously exist (Brown & Issacs, 2005). Youth participation includes "efforts by young people to plan programs of their own choosing; by adults to involve young people in their agencies; and by youth and adults to work together in intergenerational partnerships" (Checkoway & Gutierrez, 2006, p. 2). This methodology is hopeful and considers youth voices as an integral part of the transformative process in strengthening community cohesiveness in an ever-changing, dynamic fast-paced environment.

The Youth Academy Café is an example of informal education. Informal education can be thought of as focusing on social discourse and reflection on real world experiences. Both formal and informal education are collaborative, however, informal education is more self-directed. Formal education involves pedagogy of inquiry with an identified knowledge base and directed questions and "requires a theory of how learning and thinking skills develop in an individual member of society, how educational processes contribute to the shaping of these skills" (Scribner & Cole, 1973, p. 553). Formal learning is different from informal learning in that the decisions regarding the objectives (what is to be learned) and the means (how it is to be learned) are created by someone other than the learner (Mocker & Spear, 1982). Informal learning may be more flexible in the methods of developing the content and how the learner consumes it. It is a more natural or holistic process. And generally speaking, the formal learning process is facilitated by educators and the informal learning evolution unfolds through leaders facilitating an activity and modeling positive behaviors (Edginton, Kowalski, & Randall, 2005).

The experience of the Youth Academy Café differs from the learning that takes place in recreation and community service organizations where the learning objectives are more self-directed and organic. There is a continuum of learning in that there are goals or outcomes for each experience, but the experiences and willingness to participate are different. Informal learning is "often described as open-ended, with few time restrictions, no specified curriculum no predetermined learning objectives no external certification" (Hodkinson, Colley, & Macolm, 2003, p. 315). Within the informal learning setting, self-directed conversation occurs around use of praxis, reflection, collaboration and interaction with others in an enjoyable activity. In the Youth Café Academy setting young people were viewed as assets who can contribute to the community.

Methods

Transformation is defined as a process of change or growth. It is a construct that implies that "one will change, alter, or even convert oneself in a marked fashion; that an individual, community, or society as a whole will change its nature, function, form, appearance, or condition" (Edginton & Chen, 2008, p.3). Florida (2002) defines today's young adults as the creative class. Their contribution to change is imperative and creating an environment where youth in the community and leaders of youth serving organizations can exchange in creative discussion offers a chance for achieving goals for improved community cohesiveness. The Youth Academy Café environment encourages the creative climate by including intellectual receptiveness, ethnic diversity and political openness; characteristics that Florida referred to as the "social structure of creativity" (p. 48).

A qualitative research methodology was utilized in this study. As Creswell (2014, p.4) has written, ". . . qualitative research is an approach for exploring and understanding the meaning of individuals or groups ascribed to a social or human problem." The analysis used in this study involved employing a rotating focus group qualitative method. In other words, participants rotated to different stations in order to discuss the questions.

In the Youth Academy Café, six questions were developed to start the conversation. Prior to the implementation of the Youth Academy Café, the program planning team met several time to identify salient topics be explored. Among these were the following:

1. What do you believe are the 3 major issues facing youth?
2. Can you discuss the ways you think the community can enhance the empowerment of youth?
3. In what ways do you think social media can be employed to understand the issues and concerns of youth?
4. How can we help young people live a life of meaning?
5. What are the key strategies in working with young people?
6. How can we capture the voices of youth in the policy making process?

Participants had to be selective in terms of focusing their attention to three of the six questions proposed. Participants were free to choose which questions they discussed as long as there were not more than six or seven individuals at each of the stations. This qualitative method of research involved the crafting of questions around the power of various issues (Grbich, 2013).

Using the data generated in the discussion groups/sessions, a thematic analysis of the findings was completed. As Grbich (2013) has suggested, "thematic analysis is a process of data reduction and is one of the major data analytical options in qualitative research" (p. 61). This process involves reducing the data into groupings in order to identify the major themes related to each of the questions. As outlined by Grbich, 2013, the thematic analysis process involves six steps. They are as follows:

(1) read and re-read your database;
(2) recall your research questions, your theoretical frameworks, your methodology and the literature you have reviewed and decide what is most appropriate to do with your data: rigorous segmentation? Intact case studies/narratives providing the basis for a poetry/a dramatic performance /a pastiche (quilt) of voices?
(3) underline/color key segments and/or write descriptive comments alongside in the margins where further insight is useful;
(4) group like segments;
(5) attach overarching labels and identify subgroupings;
(6) conceptualize these groupings and link with literature and theory (p. 61). The following is a synopsis of the comments offered in each of the group sessions.

Findings

One of the six questions that were proposed to participants asked, "*What do you believe are the 3 major issues facing youth?* Themes emerging from the discussion of the question indicated that there are multiple parameters for defining youth, the need to assist youth in questions regarding their identity, and youth transitions as they move through life. In addition, themes emerging from this conversation, suggested a focus on positive parental influences and assisting youth in locating resources. For example, themes pointing toward the multiple dimensions of youth (e.g. race, ethnicity, gender identity, at-risk youth, individuals with disabilities, individuals with non-mainstream orientations, and age) emerged as a significant pattern. In addition, identity and transition to adulthood were also major themes identified. Further, participants responding to this question reviewed types of solutions to the challenges identified including structural ones and perhaps the use of radical social work education.

A rather fundamental question addressed by the academy revolved around the issue of community involvement as it pertains to *youth empowerment*. More specifically, participants were asked the following question: Can you discuss the ways you think the community can enhance the empowerment of youth? Themes arising out of this discussion were many and varied, and covered areas ranging from topics related to multiple parameters for defining youth, youth passions, and ways of getting youth to harness their skill sets and bridge the gap between community advocates by allowing for youth self-advocacy. These concepts were broken into the idea of providing a forum or venue for youth to have a voice and articulate their views through youth-friendly methods such as social media. Mentoring and effective communication methods with and between stakeholders were other perspectives presented to ensure continuity of youth-centered discussions and opportunity for necessary compromise between generations. The vision is to help parents and mentors detach so that youth may learn autonomy and self-advocacy. Ultimately, participants

observed that adults should utilize their voices to connect creatively with youth in replicated, community-based Youth Cafés where they are present.

The Youth Academy Café provide an avenue for young people to express their ideas, views and opinions regarding the use of social media to their daily lives. Youth employ a wide range of social media on a daily basis and it has become a prominent part of the lives of many young people. Examples include Facebook, Twitter, Myspace, Instagram, Snapchat, Blogger, Tumblr, Yik Yak, Whisper, gaming sites as well as video sites such as YouTube. These forms of social media and other uses of technology have become an inescapable facet of modern life, particularly for youth.

The Youth Academy Café captured the benefits that *social media* offers to youth. The discourse revealed that it is a portal for voice and communication and helps to provide updated information for one's immediate environment and the world at large. It is a way of maintaining connectivity and increasing one's social capital. Social media is a milieu that may strengthen the relationship that one has with others regardless of the distance. It is a psychological and sociological phenomena as much as it is a technological one (Solis, 2012).

Social media provides opportunities which enable youth to share the information in interesting ways (written, art, theatre, etc.), explore their own thoughts and feelings about the topics, react to issues, contribute critically, reflect on others perception and critique the philosophical views of others. Through the actions of youth, the world has been changed. When terrorism struck France on November 14, 2015, social media provided users with the opportunity to demonstrate their solidarity and empathy by portraying the national flag of that country on their profile picture. Because young people often have the desire, energy and idealism to do something to change the world, they become powerful agents for change. However, the voices of youth are often suppressed. The strength of social media is virtually unlimited.

One cannot ignore the fact that nowadays social media plays an essential role in the lives of youth. Youth are spending at least an hour on these popular social media sites. In a report on American Academy of Pediatrics (2011) regarding the impact of social media, it has been reported that 22% of adolescents log on to a social media Web site at least once a day, and nearly one-quarter of teens noted they log on to their favorite social media sites 10 or more times each day. More than half of adolescents log on to a social media site more than once a day. About 75% of teenagers now own cell phones, and 25% use them for social media, 54% use them for texting, and 24% use them for instant messaging. Clearly this is a strong indicator of young people's engagement with social media as a forum for communication.

Yet another question posed at the Youth Academy Café, addressed how young people may be helped to *live a life of meaning* while discovering the patience to wait until meaning reveals itself. The concept of meaning making has been linked to learning theory by Hein who notes, "Constructivism is an educational theory that both recognizes the importance of individual meaning making and makes it a central aspect of pedagogic practice" (Hein, 1999, p. 16). It seemed that some of the Youth Academy Cafe participants were accentuating the notion that youth know quite well who, where and what constitute meaning in their lives and that adults ought to give youth a platform to shape one's experiences based on one's own definition of meaning making. It was suggested that meaning construes a purpose in life, and does not necessarily imply that one will never fail. Burger (2012) noted that, "Individuals need to embrace the realization that taking risks and failing are often the essential moves necessary to bring clarity, understanding and innovation" (p. 1). Prudent risk taking, the participants noted, include reaching out to others, engaging in new experiences with intentionality and exploring new vistas with enthusiasm and passion. Still another notion had to do with the importance of youth engaging in intergenerational work to foster greater sensitivity. This is of utmost importance today when elders, like youth, make up a considerable percentage of the Nation's demographic. It is essential that these two segments of society grow in their ability to dialogue with one another in order to promote insight and a richer social fabric.

Strategies for working with young people are broad and many, and discussions with young people during the youth academy identified several areas of emphasis and methods to consider when working with youth. To gain insight into the matter of effective strategies, participants were asked the

question, what are the key strategies in working with young people? Responses and strategies discussed centered on factors such as 1) creating a welcoming youth-centered environment 2) providing effective leadership based on collaboration and trust, and 3) fostering youth development and empowerment by focusing on strengths and enhancing gifts through marketing and youth-centered mediums such as social media. The overall idea was based on the belief that interaction with youth should appeal to youth interests such as marketing to their style, providing free food and refreshments, and utilizing hands-on, interactive, spontaneous activities to sustain their focus. A large part of the discussion emphasized the importance of providing positive role models, encouraging reciprocal discussions, maintaining respectful communication, and keeping the atmosphere inviting and non-judgmental. Moreover, it was noted that Youth Academy Cafe environment should reflect positivity, respect, universal input, and finding ways to enhance individual strengths. Also, it was noted that refreshment should be served as a lure to get youth to the venue of discussion.

The discussion on capturing the voices of *youth in the policy making process* included emerging themes such as youth passion towards policy making, young people's perception of being outside the halls of money, power and influence, and the power of positive language. When young people are working to address problems, specifically facing youth or their communities, they must address the fact that young people are politically disempowered and often denied connection to the decision-making (James & McGillicuddy, 2001). Young people can be empowered by taking part in the policy process.

The participatory action research theoretical framework of the Youth Academy Café involved "systematic research and professional guidance with the development of a practical intervention tailored to the user population in collaboration with the user population" which in this instance, is the young people (Dold & Chapman, 2011). The Youth Academy Café format encouraged social action or the process of individuals and groups enhancing the ability to take control of their lives. In this foray, youth were encouraged, alongside community leaders to "make sense of their views, experiences and priorities and consider different actions and choices within the context of current local service provision" (Percy-Smith, 2006). The Youth Academy Café was a start to encourage youth to participate in the policy making process. The community leaders of organizations serving youth inspired the participants to express their opinions and questions on policy making and guided them through a process through which they could become involved in the policy making process.

The Harvest

At the conclusion of the Youth Academy Café, a process known as the "harvest" takes place. This process occurs after the group/stations report out the insights and results from their conversations. These results were summarized by the program facilitator. Activities of the Youth Academy were summarized and several key features were graphically recorded so that the entire group could visualize the items. The following patterns emerged: a) youth may be transformed by putting them in touch with individuals who will help them discover their passion; b) youth may be nurtured through relationships and activities that help them find meaning in their lives and assist them in reaching their own self-imposed limitations; c) it is important that there be a structure in place to support efforts with youth; d) intentionality assists youth in finding their voice; e) communication efforts could occur through the use of carefully vetted social media; f) all viable suggestions from youth and other participants should be considered; f) adults should be willing to partner with youth in order to provide support and decrease fear; g) connections with others should be valued and sought out to promote good eventualities happening for youth since we're all in this together.

Several of the participants' direct comments were captured by one of the Youth Academy Café team members. These comments provide additional meaning of the substance and value of the event for a range of the participants. The first comment focused on the opportunity the Youth Academy Café offered as a form of engagement. As the individual noted:

> *Initially at the beginning of the event, when I stepped in and saw the questions, I was nervous because I felt I will have very little to say regarding the event, knowing that there were professionals in the event. But on a contrary it was so engaging and I connected well with the discussion at the various table.*

It is evident in viewing this comment that the Youth Academy Café model provided for a high level of engagement. The fear sometimes experienced by participants was decreased as a result of the efforts of the facilitators and the conversation itself.

Another participant noted that the process broadened their philosophy. As they indicated,

> *. . . we talked about the sophistication of youth. The discussion was just larger than leisure and youth.*

Thus, the Youth Academy Café served to inform participants as it created a platform for learning. This was a major benefit of the event. In fact, it was more than a social event. It demonstrated that learning is often best exhibited in a social context wherein people can share not only their knowledge, but their life experiences. As one of the major research questions dealt with issues and challenges facing youth, the conversation informed participants of the importance of this topic from a variety of perspectives.

The Youth Academy Café also provided individuals with an opportunity of retrospective view of their own youth. The event not only included youth, but also included community members and enabled all to capture elements in their development that impacted on their lives. As one participant noted:

> *The questions took me back to my teenage years. I grew up in a juvenile system. The issue of Youth Voices being heard was very important to me. I felt good to reflect on whether or not I had a voice. And I think I had a voice but it was heard negatively. It is interesting to me that the program emphasized on using the strength of youths, building their assets and the development of positive psychology.*

The conversation triggered participants to share their life experiences and one particular facilitator noted their struggle of how they may have failed to help their children realized their dreams because they pressed their children not to fully have their voices, choice of actions and/or take responsibility.

Implications for Professional Practice

Several implications for professional practice may be drawn from the Youth Academy Café experience. They are as follows:

1. **Youth Need a Voice.** It's important that the voice of youth be not only represented in the activities of park, recreation and leisure service organizations, but also in the wider community.
2. **The Value of the Youth Academy Café.** The Youth Academy Café based on the World Café concept and process is an effective strategy that can be employed to engage youth in meaningful dialogue.
3. **Youth and Community Members.** The Youth Academy Café provided an opportunity to join together community members and youth to interact together in a non-judgmental environment to address challenges and concerns.
4. **Provided a Focus on Salient Youth Issues.** The Youth Academy Café provided a structured format to discuss a focused number of questions related to key issues and concerns facing youth in the community.
5. **The Emergence of Other Topics for Review.** The Youth Academy Café provided an opportunity for individuals to identify other topics that could be served in a different format. Some of these included: human sexuality, alcohol and drug abuse, family relations, living a purposeful life, and developing one's potential.
6. **Networking.** An important collateral benefit of the Youth Academy Café was the opportunity for networking. This occurred not only between and among youth and community members, but also the youth themselves. Students gained opportunities to work in community organizations as a result of their participation in the Youth Academy Café.
7. **Understanding Community Resources.** The Youth Academy Café created awareness amongst students of the various community assets. Coupled with the idea of networking, students and community members were able to align their common professional interests with current opportunities within the community and region.

8. **Leadership Development.** The Youth Academy Café provided leadership opportunities to students and community members. Relationships were formed that could lead to future mentoring opportunities.
9. **Age Ranges.** As the social construct of youth using the United Nations definition, ranges from 15 – 24 and the mean age for the Youth Academy Café was 22.3 years of age, it is presumed that the concept could be implemented with younger as well as older individuals.

In sum, the Youth Academy Café provided a unique format for engaging youth with community members. The opportunities for youth to express themselves in a supportive and non-judgmental environment enabled a free flow exchange of ideas and concepts as well as an opportunity to address various community issues and challenges. It was evident that there are numerous implications for professional practice. As a process tool, the Youth Academy Café could be utilized in a variety of different settings to draw attention to various concerns and issues.

Conclusion

The Youth Academy Café presented an active form of engagement for youth and an opportunity to connect with community leaders of youth organizations. This collaboration fostered a program which allowed the voices of youth to be heard. The Youth Academy Café format was conducive to starting the discussion on six specific questions/topics related to youth voices. These included the issues that youth face in the community and how the community can respond, social media and its impact on hearing youth voices, how can we help youth live a life of meaning, key strategies on working with young people, and how to involve youth and let their voices be heard in the policy making process.

The Youth Academy Café provided a powerful process for fostering constructive dialogue and communication. Conversation and dialogue are the essence of youth work. The café provided an opportunity for gaining the collective

intelligence of participants at the event. Creative, innovative suggestions and recommendations were offered that may lead to future action and direction. The youth perspective can offer singular and invaluable views related to concerns and issues and other topics that affect young people's participation in the community. Authorizing youth perspectives "recognizes and responds to the profound and unprecedented ways in which the world has changed and continues to change" and the position youth occupy in relation to this change (Cook-Sather, 2002, p. 3).

This initial event, sponsored by the Institute for Youth Leaders, offered a start to a conversation on empowering and engaging youth in the community and demonstrating a vehicle for young people to add to the dialogue. Youth can contribute in meaningful ways to the conversation on issues or concerns that impact their lives. The Youth Academy Café was a start in this direction. Leaders from youth serving organizations interacted with young people in an open-ended, comfortable environment and the outcome included the "harvest" or the report of the insight or "a-ha" moments that resulted from their group discussions. This information is vital for determining the direction of the Institute for Youth Leaders and the youth in the community and surrounding areas. RMA

Corresponding Author:
Christopher R. Edginton
Christopher.edginton@uni.edu

References

Adler, P. S., & Kwon, S. W. (2002). Social capital: Prospects for a new concept. Academy of Management Review, 27(1), 17-40.

African Union. (2009). The African Youth Decade [2009-2018] Plan of Action. Retrieved December 4, 2015 from http://africa-youth.org/files/decade-en.pdf

Arches, J. (1997). New voices in university-community transformation. Change, 29(1), 36-41.

Berg, M., Coman, E., & Schensul, J. J. (2009). Youth action research for prevention: A multi-level intervention designed to increase efficacy and empowerment among urban youth. American Journal of Community Psychology, 43(3-4), 345-359. doi:10.1007/s10464-009-9231-2

Brown, J., & Isaacs, D. (2005). *The world café : Shaping our futures through conversations that matter*. San Francisco, CA: Berrett-Koehler Publishers.

Burger, E. (21 August 2012). Teaching to fail. *Inside Higher Ed*. Retrieved from https://www.insidehighered.com/.../2012/.../21essay-im...

Checkoway, B. N., & Gutierrez, L. M. (2006). Youth participation and community change. *Journal of Community Practice,* 14(1-2), 1-9.

Cook-Sather, A. (2002). Authorizing Students' Perspectives: Toward Trust, Dialogue, and Change in Education. Educational Researcher, 31(4), 3-14. doi:10.3102/0013189x031004003

Cooperrider, D. L., & Whitney, D. K. (2005). *Appreciative inquiry: A positive revolution in change*. San Francisco, CA: Berrett-Koehler.

Creswell, J.W. (2014). Research design: *Qualitative, quantitative, and mixed methods approaches*.4th ed. Thousand Oaks, CA: Sage.

Dold, C. J., & Chapman, R. A. (2011). Hearing a voice: Results of a participatory action research study. *Journal of Child and Family Studies,* 21(3), 512-519. doi:10.1007/s10826-011-9505-9

Edginton, C. R., & Chen, P. (2008). *Leisure as transformation*. Champaign, IL: Sagamore Publishing.

Edginton, C.R., Kowalski, C.L., & Randall, S.W., (2005) *Youth Work: Emerging Perspectives in Youth Development Champaign,* IL: Sagamore. 311.

Emery, M., & Flora, C. (2006). Spiraling-up: Mapping community transformation with community capitals framework. *Journal of the Community Development Society, 37*(1), 19-35.

Ferrance, E. (2000). *Action research*. *Providence,* RI: LAB.

Florida, R. L. (2002). *The rise of the creative class: And how it's transforming work, leisure, community and everyday life*. New York, NY: Basic Books.

Grbich, C. (2013). *Qualitative data analysis: An introduction*. 2nd ed. Thousand Oaks, CA: Sage.

Hein, G.E. (1999). Is meaning making constructivism? Is constructivism meaning making? *The Exhibitionist,* 15-18.

James, T., & McGillicuddy, K. (2001). Building youth movements for community change. *Nonprofit Quarterly, 8*(4), 1-3.

Mocker, D. W., & Spear, G. E. (1982). Lifelong learning: Formal, nonformal, informal, and self-directed. Information Series No. 241.

Percy-Smith, B. (2006a). From consultation to social learning in community participation with young people. *Children Youth and Environments, 16*(2), 153-179.

Percy-Smith, B. (2006b). 'You think you know? ... You have no idea': youth participation in health policy development. *Health Education Research,* 22(6), 879-894. doi:10.1093/her/cym032

Sethi, J. (2010). Creating a culture of youth voice through sharing power and expanding possibilities. Retrieved November 24, 2015 from http://www.search-institute.org/blog/creating-a-culture-of-youth-voice

Solis, B (2012, March 14) Social media is about social science not technology, Retrieved December 11, 2015 from http://www.brianso lis.com/2012/03/social-media-is-about-social-science-not-technology/

The American Academy of Pediatrics (2011, March 28) Clinical Report –The Impact of Social Media on Children, Adolescents and Families, Retrieved December 11, 2015 from http://pediatrics.aappublica tions.org/content/pediatrics/early/2011/03/28/peds.2011-0054.full.pdf.

Jalloh, A. (2012). The United Nations 50th Session of the Commission for Social Development – Poverty Eradication: a World Leisure Overview. *World Leisure Journal,* 54 (2), 189-192.

Jalloh, A. (2015). Empowerment: The rights of young people and the United Nations system. *International Leisure Review,* 4 (1), 157-184.

Powers, J. L., & Tiffany, J. S. (2006). Engaging youth in participatory research and evaluation. Journal of Public Health Management and Practice, 12, S79-S87. doi:10.1097/00124784-200611001-00015

Putnam, R. D. (1995). Bowling alone: America's declining social capital. *Journal of Democracy,* 6(1), 65-78. doi:10.1353/jod.1995.0002

Smith, W. A. (1976). The meaning of conscientizacao: The goal of Paulo Freire's pedagogy.

Scribner, S., & Cole, M. (1973). Cognitive consequences of formal and informal education. Science, 182(4122), 553-559.

The World Café. (2015). The world café: Shaping our futures through conversation s that matter.

Retrieved December 4, 2015 from http://www.theworldcafe.com/key-concepts-resources/design-principles/

United Nations Department of Economic and Social Affairs. (2005). World youth report 2005: Young people today, and in 2015. Retrieved December 4, 2015 from http://www.un.org/esa/socdev/unyin/documents/wyr05book.pdf

United Nations Educational, Scientific, and Cultural Education. (n.d.). About the youth programme. Retrieved from December 4, 2015 from http://www.unesco.org/new/en/social-and-human-sciences/themes/youth/youth-definition/

The Review of Kindergarten's Physical Fitness and Motor Ability Development

Song Huiqi
Beijing Sports University, China
Lau Patrick WC
Hong Kong Baptist University

Background of research

Recently, the physical health of preschoolers (age 3-6 years old) has become a worrying problem. The proportion of overweight and obese children is increasing at an alarming rate. Studies have showed that the proportion of obese children in the United States is large (Trost, Sirard, Dowda, Pfeiffer & Pate, 2003), accounting for 1/4, which is caused by the lack of physical activity (PA). American public health data have confirmed that obese and inactive preschool children are quite common in the United States (Timmons, Leblanc, & Carson, 2012; Oliver, Schofield, & Kolt., 2007; Janssen & LeBlanc, 2010; Morrow Jr et al., 2013). The UK, Canada, Australia and other countries and regions have also seen an increase in the obesity rate of preschool children (Reilly & Dorosty, 1999; Tremblay & Willms, 2000; Booth et al., 2001). The survey about Chinese young children' obesity found that preschoolers in urban areas are also facing very serious obesity problem, preschool children obesity rate has been rising. According to the evaluation of "height standard weight", it showed that in the height standard weight distribution of urban and rural children, there is a so-called "double peak phenomenon" that the ratio of "overweight children" and "low weight children" both ends rise, but the ratio of normal weight children decreases instead (China Physical Fitness Research Society, 2004). Studies have confirmed that preschoolers' physical health problems will severely threaten children's health, which will not only increase the risk of obesity in adulthood, but also result in chronic diseases such as hypertension, heart disease and diabetes (Burgi, Meyer, & Granacher, 2011).

The comparison of national constitution monitoring in recent decade shows that the comprehensive physical index of children aged 3-6 years in 2010 was 102.03, only 0.06% higher than that in 2005, and 1.97% higher than that in 2000.This change indicates that since 2000, the overall physical fitness of preschoolers aged 3-6 years in China has been on a continuously upward trend, but the rising rate has slowed down significantly. For example, the Sit And Reach, which can reflect the flexibility, decreases from 10m to 8.8m in males with age between 3 and 6 years old (Jian, 2006).From 2000 to 2010, the tennis throwing performance of preschool children showed an overall decline, slightly decreased in 2005 compared with that in 2000, and significantly dropped in 2010 compared with that in 2005 ($P < 0.05$). In addition, the improvement of preschool children's body shape and physical fitness in China during 2000-2005 was much greater than that during 2005-2010 (Yuantian, 2012).

Importance to understand physical fitness and motor ability:

Young children are the future of the country, and their physical health are related to the development of the country. Early childhood is a critical period during human growth and development, and an important period for the establishment of healthy PA. Good physical fitness is related to all aspects of children's growth, and the physical fitness level at this stage is more concerned about the health level of children and adolescence (Weiping, 2009).Therefore, children's physical health is particularly important. Paying attention to children's physical health is conducive to improving our overall health level and promoting the development of the whole society's physical health.

In the meantime, the early childhood is the stage for the formation of various basic motor skills of human beings, and is the critical period for the development of basic motor skills and the cultivation of motor ability. A large number of studies at home and abroad have confirmed that it is a significant stage to establish and learn basic motor skills in the early to middle age of children, which is the sensitive period for the formation of basic motor skills in the age group of about 3-10 years old. At the same time, the learning and establishment of basic motor skills in childhood improves the children's motor response to a certain extent, and lays a good foundation for the future learning of complex motor skills, so that they have a lot of room for choices in sports exercise and sports career (Lulu, 2018). Among the daily physical activities and movements used by adolescents and adults, 80% to 90% are acquired in early childhood. The reason for the weak motor ability of many adults lies in the lack of appropriate environmental conditions in the period of basic movements, and the lack of proper development of basic movements (Yuanyuan, Longxiang, Zhexiao, & Huanbin, 2018). Since the beginning of the 20th century, motor development has become the main indicator of early childhood development assessment, and most western countries have set the primary goal of physical health as promoting the motor development of children. For the first time, motor development is listed as one of the goals in the field of children's health in the newly issued 3-6 Years Old Preschoolers' Learning And Development Guideline in China. The learning of basic motor skills is the basic condition for people to learn various motor skills and complete or participate in various sports.

Relationship between physical fitness and motor ability:

PA, physical fitness and motor ability development are closely related to each other in early childhood. On the one hand, in the dynamic correlation between PA and motor skill development level, physical fitness may be a vital intermediary factor that cannot be ignored. This correlation may be relatively weak in the early life of an individual, but it will grow with age (Robinson, et al., 2015). On the other hand, childhood PA is a crucial determinant of the development of motor skills and physical fitness level. Obtaining and accumulating all kinds of exploratory sports experience in early life can promote formation and maturity of children's basic motor pattern, further inspire children to participate in the PA, and have a positive effect on physical fitness levels (Stodden, Goodway & Langendorfer, 2008). For individuals, because PA is a controllable external behavior's factor, in-depth studies and exploration of PA, physical fitness and motor development as well as its complex correlation with age will have great and long-term influence to promote child and adolescent PA, obesity intervention and health promotion.

Research update of physical fitness, motor ability and physical activity in preschoolers:

Through the literature search, the researches related to 3-6 years old children's physical health were searched and summarized as below:

1. Physical fitness:

Source	Time	Country	Subject	Testing protocol	Findings
J Castro-Piñero, E G Artero et al	2010	Spain	N=130(3-5 year old) 77boys and 53 girls	Review paper	The 20 m shuttle run test is a valid test to estimate cardiorespiratory fitness, that the hand-grip strength test is a valid measure of musculoskeletal fitness, that skin fold thickness and body mass index are good estimates of body composition, and that waist circumference is a valid measure to estimate central body fat. Moderate evidence was found that the 1-mile run/walk test is a valid test to estimate cardiorespiratory fitness. A large number of other field-based fitness tests presented limited evidence, mainly due to a limited number of studies (one for each test). The results of the present systematic review should be interpreted with caution due to the substantial lack of consistency in reporting and designing the existing validity studies.
Cristina Cadenas-Sánchez1 et al	2014	Spain		The PREFIT Battery	PREFIT results are the largest and most reliable in this age group.Future longitudinal or intervention studies using the test should take into account that changes in test scores at the two stages may be due to variability in measurement, while broader changes may be due to intervention or age-related changes.
Francisco B. Ortega et al	2014	Sweden		Review paper	After analyzing the information retrieved in the current systematic review about fitness testing in preschool children, proposing the PREFIT battery, field-based FITness testing in PRE school children.
B. Martinez-Tellez,G. Sanchez-Delgado	2015	Spain	N=403(3-5 year old) 233 boys and 170 girls	The PREFIT Battery	There was a significant association between all health-related physical fitness tests and body mass index.
Pedro Ángel Latorre Román1, David Mora López 2	2015	Spain	N=553 (3-6 year old) 274 boys and 279 girls	Fitness Test Battery	Fitness Test Batteryis an effective, reliable and easy testing tool to evaluate the physical health of preschool children.
Cristina Cadenas-Sanchez et al	2016	Spain	N=161(3-5 year old) 93 boys and 69 girls	The PREFIT Battery	The PREFIT battery is a feasible and reliable tool to assess physical fitness in preschool children yet standing long jump has shown mixed findings and requires further studies. The one-leg stance test showed poor reliability in our study and if confirmed by future studies, its use in 3 to 5 years-old would not be recommended. Future studies should consider the mean differences provide in this study to explain the changes in test performance.
Yuting	2017	China	N=126 (3-6 year old) 54 boys and 72 girls	National standard for physical fitness measurement (for children) Bruininks-Oseretsky test of Motor Proficiency	The method of measuring children's balance ability in gamification can effectively measure the change level of children's balance ability.
Hongkuan	2018	China	N=115 (3-6 year old) 59 boys and 56 girls	standing broad jump in National standard for physical fitness measurement (for children) Gamification - determination of explosive force of lower extremity	The determination method of gamified lower limb explosive force can measure the change level of children's lower limb explosive force and has certain sensitivity.

2. Motor ability:

Source	Time	Country	Subject	Testing protocol	Findings
Logan, Scrabis-Fletcher, Modlesky, & Getchel	2011	USA	Thirty-eight children ages 4-6 years	Movement Assessment Battery for Children-2 (MABC-2)	direct relationship between motor proficiency and BMI
Roberts, Veneri, Decker, & Gannotti	2012	UAS	4650 kindergarten children		Children with obesity displayed lower gross motor skill levels
Shengkou, Guiping	2015	China	N=289 (3-6 year old) 145 boys and 144 girls	TGMD-2	There was a significant positive correlation between gross movements of children and their physical health level, but no significant correlation between gross movements of children and their body mass index.With the increase of age, children's motor development level and physical health level were significantly improved, but the change of BMI was not obvious, which verified that children aged 3-6 years were in the critical period of motor development.
Ke, Xinsheng	2016	China	N=295 (3-6 year old) 161 boys and 134 girls	TGMD-3	TGMD-3 and PSPC-P are suitable for assessment of mobility motor development in children aged 3-6 years.The levels of mobility motor development and body perception of girls were higher than those of boys.There is a significant positive correlation between the perceived physical ability of children aged 3-6 years and the development of mobility movement, and mobility movement has an important impact on the perceived physical ability.
Aye, Oo, Khin, Kuramoto-Ahuja, & Maruyama	2017	Japan	472 healthy Kindergarten 5-year-old	TGMD-2	average level of gross motor skill rank differences were also found between subjects from urban and rural areas gender-based and region-based differences.
Aye et al	2018	Japan	60 healthy 5-year-old	TGMD-2	average level of overall gross motor skills. Girls had significantly better locomotor skills. Boys had significantly better object control skills.
Engel, Broderick, van Doorn, Hardy, & Parmente	2018	Australia		Review paper	In school-age children, low proficiency in fundamental movement skills (FMS) is associated with low physical activity (PA). It is unknown if the same relationship exists in pre-schoolers (aged 3-5 years).

3. Physical activity:

Source	Time	Country	Subject	Testing protocol	Findings
Diane M. Jackson, John J. Reilly	2003	Scotland	N=104 (3-4 year old) 52 boys and 52 girls	Accelerometer	This study suggests that total activity increases during the preschool period in Scottish children and that gender differences in total activity are present early in life.
R Jago1, T Baranowski1, JC Baranowski	2005	USA		The Children's Activity Rating Scale	Focusing on reducing time spent watching television and increasing time spent in physical activity may be successful means of preventing obesity among this age group.
Greet Cardon, Ilse De Bourdeaudhuij	2007	Belgium	N=129 (4-5 year old)	Pedometer and accelerometer	Step counts on preschool-attending days were compared with step counts on weekend days, and possible differences between children attending different preschools were evaluated for step-count levels during weekdays

Shreela Sharma1, Ru-Jye Chuang	2011	USA	N=94 (3-6 year old)	The System for Observing Fitness Instruction Time for Preschoolers (SOFIT-P)	The System for Observing Fitness Instruction Time for Preschoolers shows promising initial results as a new method for measuring physical activity among preschoolers.
Michael W. Beets, MEd, MPH, PhD, Daniel Bornstein, BS	2011	USA	N=397 (3-5 year old)	NASPE	The variation in NASPE guidelines, coupled with different accelerometer cut points, results in disparate estimates of (in)active preschoolers. This limits the ability to estimate population prevalence levels of physical activity that can be used to guide public health policy. Development of new guidelines should focus on an explicit delineation of physical activity and attempt to standardize the measurement of preschoolers' physical activity.
Didier Garriguet, Valerie Carson, Rachel C. Colley	2016	Canada	N=865 (3-5 year old)	Accelerometer and questionnaire	An estimated 73% of 3- to 4-year-olds and 30% of 5-year-olds met their respective physical activity guidelines. Screen-time targets were met by 22% of 3- to 4-year-olds and 76% of 5-year-olds

4. Literature search results

In China National Knowledge Infrastructure (CNKI) and PubMed, studies from 2000 to 2018 were searched by using kindergarten children's health, physical fitness and motor ability as keywords. After screening, the following results were obtained:

Research topic	Research content	Article Number
Physical fitness	assessment method	9
	status analysis	12
	intervention	9
	current problems	2
Motor ability	assessment method	8
	status analysis	17
	intervention	14
	current problems	2
Physical activity	assessment method	3
	status analysis	16
	Guideline	4
	intervention	13
	current problems	2
The relationship between the PA, motor ability, physical fitness and health		12
Total		123

The development of preschoolers' physical fitness and motor ability test:

1. Physical fitness

Time	Title	Source	Dimension	Test indexes	Application situation
1982	FITNESSGRAM	The Cooper Institute	cardiopulmonary endurance, muscular endurance, body shape, flexibility	Shuttle run, skinfold thickness or BMI,volume of abdominal,Trunk flexibility,90°push-up or corrected pull-up (oblique pull-up) or bend arm hang	More than 6,700 schools in 50 states in USA and tests for children aged 5 to 17 in 14 countries and regions around the world
2000	National standard for physical fitness measurement (for children)	General Administration of Sport of China	body shape, sports quality	stature,weight,10m shuttle run,standing broad jump,tennis throw away,double jump,sit and reach,balance beam	Since 2000, it has been used in the research and testing of children aged 3-6 in China
2011	ALPHA-FIT	J.R.Ruiz1, V. España Romero et al	cardiopulmonary endurance, muscular endurance, body composition, motor ability	20m shuttle run, standing broadjump, grip strength, stature, weight,waist, 4*10m shuttle run, triceps and subscapular fold thickness	It is used in research tests on children and teenagers in parts of Europe
2015	The PREFIT Battery	Ortega et al	cardiopulmonary endurance, Musculoskeletal function, Sport-related physical fitness	20m shuttle run, standing broad jump, grip strength, 4*10m shuttle run and trendelenburg test	It is being tested in studies of pre-school children in Europe

2. Motor ability

Time	Title	Source	Composition	Application situation
1967	DDST	Denver,USA	personal sociability, fine motor adaptability, swallow ability, big action ability	It is widely used in infants from birth to 6 years old, and can screen out some children who may have problems but are clinically asymptomatic, which is effective in identifying children with high-risk developmental delay
1992	CDCC	Zhang Houcan et al	Intelligence development scale and motor development scale	The intelligence development scale has 11 items of tests, and the motor development scale has 5 items of tests.To evaluate the comprehensive development of 3-6 children in China
2000	TGND-2	Dale A. Ulrich et al	Mobility action test scale, operational action test scale	It is widely used in the evaluation of gross motor development in children aged 3-10 years
2000	GMFM	Russell et al	lying and turning (17), sitting (20), climbing and kneeling (14), standing (13), walking, running and jumping (24)	It can effectively measure the change of gross motor function in children with cerebral palsy
2018	Evaluation scale for gross motor development of 3-6 year old preschool children	Guo Chen, Luo Dongmei et al	the displacement ability, object control, postural control	It is used to evaluate the motor development of 3-6 children's large muscle group in a small part of China

Current research challenges and missing link:

Compared with the research studies in Occident, the research on preschoolers' physical health in China started relatively late, and there are very few relevant literature for reference. To conclude, there are some challenges that need to be researched:

1. Researchers: The lack of exercise science researchers to investigate in this younger age children's physical health, PA, physical fitness and motor ability. It is imperative to have more researchers to pay attention to this younger children population on these areas of exercise and health.
2. Research depth: Chinese researchers mainly focus on the results of national physique monitoring, status analysis, influence factors, evaluation indexes and so on. The research content is descriptive and therefore the research depth is insufficient. More in-depth researches on the universal standards, physical norms and testing protocol should be investigated to provide a solid basis of this research area.
3. Participants: The participants of the China studies are mainly preschool children aged from major urban cities. The sample size is not balance among different cities. Rural areas should be covered and the sample size should keep balanced.
4. Research methods: Most of the research methods are literature review. Moreover, the physical fitness test items and standards are not consistent between years and cities/ region. The results may not be comparable.
5. Norm table and intervention development: it is imperative to develop the national physical fitness and motor ability norm for the development and delivery of intervention in kindergartens.

Missing link:

Below are the suggestions to strengthen the younger children's research on PA, physical fitness and motor ability:

1. Longitudinal study of the association between physical health and physical fitness in preschool children.
2. Research on the rural children's physical health and the physical development of special groups of children.
3. Exploration of the norms of physical fitness and motor ability for 3-6 year old children'.
4. Big data research on children aged 3-6 years in both cities and rural area.
5. Comparative studies on younger children's physical health, among different ethnic groups and age groups.

To conclude, the research on kindergarten children's PA, physical fitness and motor ability is still under-investigated and it needs much more scientific studies to produce a more evidence-based research to tackle the challenges and bridge the missing links in this research area. I believe this rising research will contribute to a better health, physical fitness and motor ability to the younger children and their later life. RMA

References

Trost, S. G., Sirard, J. R., Dowda, M. Pfeiffer, K. A., & Pate, R. R. (2003). Physical activity in overweight and nonoverweight preschool children. International Journal of Obesity, 27, 834–839.

Timmons, B. W., Leblanc, A. G. & Carson, V. (2012). Systematic review of physical activity and health in the early years (aged 0–4 years). Applied Physiology, Nutrition, and Metabolism, 37, 773–792, 2012.

Oliver, M., Schofield, G. M. & Kolt, G. S. (2007). Physical activity in preschoolers: Understanding prevalence and measurement issues. Sports Medicine, 37, 1045–1070.

Janssen, I. & LeBlanc, A. G. (2010). Systematic review of the health benefits of physical activity and fitness in school-aged children and youth. International Journal of Behavioral Nutrition and Physical Activity, 7, 40.

Morrow, J. R., Tucker, J. S., Jackson, A. W., Martin, S. B., Greenleaf, C. A. & Petrie, T. A. (2013). Meeting physical activity guidelines and health-related fitness in youth. American Journal of Preventive Medicine, 5, 439–444.

Reilly, J. J., & Dorosty, A. R. (1999). Epidemic of obesity in UK children. Lancet, 354,1874–1875.

Tremblay, M. S., & Willms, J. D. (2000). Secular trends in the body mass index of Canadian children. Can Med Assoc J, 163, 1429–1433.

Booth, M. L., Wake, M., Armstrong, T., Chey, T., Hasketh, K., & Mathur, S. (2001). The epidemiology of overweight and obesity among Australian children and adolescents, 1995–97. Aust NZ J Pub Health, 25, 162–169.

China Physical Fitness Research Society. (2004). Present situation and prospect of sports science research. Beijing:China Sport Science Society, 296.

Burgi, F., Meyer, U. & Granacher, U. (2011). Relationship of physical ¨activity with motor skills, aerobic fitness and body fat in preschool children: A cross-sectional and longitudinal study (Ballabeina). International Journal of Obesity, 7, 937–944.

Jian, L. (2006). A Review of Literature :The Study on the Body Constitution of 3-6-year-old Children. SPORT SCIENCE AND TECHNOLOGY, 27(2), 68-78.

Yuantian, L. (2012). Dynamic changes of physiques of Chinese 3-6 year-old preschoolers from 2000 to 2010. Shandong Sports Science & Technology, 34(6), 88-92.

Weiping, L. (2009). National physical health science and technology guide manual. Beijing: Peoples Sports Publishing House.

Lulu, G. (2018). Study on the Process of Basic Action Skills in Children. Physical Education Review, 37(8), 120.

Yuanyuan, L., Longxiang, Z., Zhexiao z., & Huanbin, Z. (2018). Research on the development status of children's physical activities and movements from the perspective of physical functional movement education. Sports Training Society. Poster presentations.

Robinson, L. E., David, F. S., Lisa, M. B., Vitor, P. L., Samuel, W. L., Luis P. R., & Eva D'Hondt. (2015). Motor competence and its effect on positive developmental trajectories of health. Sports Med, 45(9), 1273-1284.

Stodden, D. F., Goodway, J. D., & Langendorfer, S. J. (2008). A developmental perspective on the role of motor skill competence in physical activity: An emergent relationship. Quest, 60(2), 290-306.

Castro-Pin˜ero, J., Artero, E. G., Espan˜a-Romero, V., Ortega, F. B., Sjostro¨m, M., Suni, J., & Ruiz, J. R. (2010). Criterion-related validity of field-based fitness tests in youth: a systematic review. Sports Medicine, 44, 934-943.

Cristina C. S., Francisco, A. M., Guillermo, S. D., José, M., Borja, M. T., Manuel, H. C., David, J. P., Pedro, F., Jonatan, R. R. & Ortega. (2014). Evaluación de la capacidad cardiorrespiratoria en niños de edad preescolar: adaptación del test de 20m de ida y vuelta. Nutr Hosp, 30(6), 1333-1343.

Francisco, B. O., Cristina, C. S., Guillermo, S. D., Jose, M. G., Borja, M. T., Enrique, G. A. C., Idoia, L., Palma, C., Marie, L., & Jonatan, R. R. (2015). Systematic review and proposal of a field-based physical fitness-test battery in preschool children: the PREFIT battery. *Sports medicine (Auckland, NZ)*, 45(4), 533-555.

Cristina, C. S., Borja M. T., Guillermo, S. D., José, M. G., José, C. P., Marie, L., Jonatan, R. R., & Francisco B. O. (2016). Assessing physical fitness in preschool children: Feasibility, reliability and practical recommendations for the PREFIT battery. Sports Medicine Australia, 19, 910–915.

Yuting, Z. (2017). An empirical study of children's constitution gaming evaluation method—take the balance stability as an example. Master's thesis.

Hongkuan, Y. (2018). Establishment and effect test of explosive force of lower limbs in children with gamification. Master's thesis.

Logan, S. W., Scrabis-Fletcher, K., Modlesky, C., & Getchell, N. (2011). The relationship between motor skill proficiency and body mass index in preschool children. *Res Q Exerc Sport, 82*(3), 442-448.

Roberts, D., Veneri, D., Decker, R., & Gannotti, M. (2012). Weight status and gross motor skill in kindergarten children. *Pediatr Phys Ther, 24*(4), 353-360. doi: 10.1097/-PEP.0b013e3182680f19

Shengkou, W., Guiping, J. (2016). A study of the characteristics of and correlation between proprioception ability and gross motor development level of children aged 3 to 6. Journal of Physical Education, 23(1), 131-135.

Ke, N., Xinsheng, S., & Xiaojun, S. (2016). The Relationship Between Locomotor Development and Perceived Physical Competence in Children Aged 3-6 Years: an Empirical Study. Journal of Beijing Sport University, 39(12), 74-82.

Aye, T., Oo, K. S., Khin, M. T., Kuramoto-Ahuja, T., & Maruyama, H. (2017). Gross motor skill development of 5-year-old Kindergarten children in Myanmar. J Phys Ther Sci, 29(10), 1772-1778. doi: 10.1589/jpts.29.1772

Aye, T., Kuramoto-Ahuja, T., Sato, T., Sadakiyo, K., Watanabe, M., & Maruyama, H. (2018). Gross motor skill development of kindergarten children in Japan. J Phys Ther Sci, 30(5), 711-715. doi: 10.1589/jpts.30.711

Engel, A. C., Broderick, C. R., van Doorn, N., Hardy, L. L., & Parmenter, B. J. (2018). Exploring the Relationship Between Fundamental Motor Skill Interventions and Physical Activity Levels in Children: A Systematic Review and Meta-analysis. *Sports Med, 48*(8), 1845-1857. doi: 10.1007/s40279-018-0923-3

Diane, M., Jackson, John, J., Reilly, Louise, A., Kelly et al. (2003). Objectively Measured Physical Activity in a Representative Sample of 3- to 4-Year-Old Children. Obes Res, 11, 420-425.

Jago, R., Baranowski, T., Baranowski, J. C., Thompson, D., & Greaves, K. A. (2005). BMI from 3–6 y of age is predicted by TV viewing and physical activity, not diet. International Journal of Obesity, 29, 557–564.

Greet, C., & Ilse, D. B. (2007). Comparison of Pedometer and Accelerometer Measures of Physical Activity in Preschool Children. Pediatric Exercise Science, 19, 205-214.

Shreela, S., Ru-Jye, C., Katherine, S., & Heather, A. (2011). Measuring physical activity in preschoolers: Reliability and validity of The System for Observing Fitness Instruction Time for Preschoolers (SOFIT-P). Meas Phys Educ Exerc Sci, 15(4), 257–273.

Michael, W. B., Daniel, B., Marsha, B. S., & Russell, R. P. (2011). Compliance With National Guidelines for Physical Activity in U.S. Preschoolers: Measurement and Interpretation. www.pediatrics.org/cgi/doi/10.1542/peds.2010-2021 doi:10.1542/peds.2010-2021

Garriguet, D., Carson, V., Rachel C. C., Janssen, I., Brian, W. T., & Mark, S. T. (2016). Physical activity and sedentary behaviour of Canadian children aged 3 to 5. Health Reports, 27(9), 14-23.

Biomechanical Comparison of Tire Flipping Techniques – the Sumo, the Backlift Style, and the Shoulder-against-the-tire

Ip Tsz Ching and Luk Tze Chung Jim
Technological & Higher Education Institute of Hong Kong

Introduction

Different strongman event such as Atlas stones, log lift, farmers walk, yoke walk, and as well as tire flip have risen up in the past decade (Winwood, Keogh, & Harris, 2011). The strongman style training become more popular to apply into the strength and conditioning training, since many specialists believe that the athletes can gain more benefit from the strongman training rather than only implement the traditional gym-based resistance training (Keogh et al., 2010; Winwood et al., 2011). The strongman style training has involved the whole musculoskeletal system while performing the movements in a multi dimension, such as power, strength, and stability (Winwood et al., 2011). Therefore, many strength and conditioning coaches integrate their training programme and combine the strongman training exercise with traditional training programme in order to gain more advantage for their athletes (Baker, 2008; Hedrick, 2003). Although many professional teams, such as rugby, American football, had utilized this kind of training, there is lack of research to support the outcome of adopting the strongman style training (Ghigiarelli, Sell, Raddock & Taveras, 2013). Under this condition, each coach definitely interpret the idea of the strongman training in their own way, which derivative varies problem, conflicts in how to incorporate and execute the strongman exercise into the strength and conditioning training programme

The movement of tire flip is similar with power clean which involve the triple extension in ankle, knee, and hip when perform the exercise, and the exercise is mainly focus in lower-body power development, also further enhance the core stability and performance in training or during the competition (Keogh et al., 2010; Bullock et al., 2010). In the past decade, most of the athletes and coaches were adopting the sumo-style as their preference, as the technique had been considered as the most safety flipping technique. However, the preference was changed in the past few years, the coaches and athletes changing their preference, using shoulder-against-the-tire technique as their first choice (Haff & Triplett, 2016). According to the National Strength & Conditioning Association (NSCA) (2016), there are three common used technique for tire flipping, including sumo style, backlift style and shoulders-against-the-tire technique. Since there is lack of research support and references for coaches in the exercise selection, the coaches need to depend on their experience and knowledge, and then take their own approach to incorporate the strongmen exercise into strength and conditioning training, so there are variety techniques of the tire flipping which may result in different training outcome. Therefore, more and deeper study about the biomechanics of tire flip is needed.

The purpose of this study was to analyze the biomechanical difference of three type of tire flips, which including the sumo style, backlift style and shoulders-against-the-tire, to get more insight and understanding the similarity and difference between those three techniques, also distinguished the differences in normalized ground reaction force and angular velocity between each flipping techniques during the first flipping phase, thus, to make more contribution in this area.

As the research in tire flip area is limited, there was no studies have examined the differences in the kinetics between three style of tie flip techniques, including the sumo style, backlift style and shoulders-against-the-tire. The selection of the exercise in the strength and conditioning training was based on the experience and judgment of the coaches, therefore, the results of this study would be useful to understand and analyze the tire flip techniques deeply, also, the research could be references for coaches to comprehend the differentiate of those three style.

Methods

Study Design

A cross-sectional descriptive design was used to compare the biomechanical different between three style of tire flip technique, including the sumo style, the backlift style and the shoulder-against-the-tire technique. Data were collected for each participant in the experimental session. There was two session to be done within a week (Swinton, Lloyd, Keogh, Agouris, & Stewart, 2012). The venue was take place in the Biomechanical Laboratory in Technological and Higher Education Institute of Hong Kong (Chai Wan).

There was total two sessions, including one practical session, and one experimental session. There was a practical session to demonstrate and teach that three tire flip technique to the participants. Then, for the experimental session, participants had performed the three style of tire flip technique in the Biomechanical Laboratory.

Participants

Nine male participants (22 ± 2 years, mass 67 ± 8 kg, height 171 ± 5 cm) were volunteered to participate in the study. The participants were recreational male athletes with at least one year gym-based experience, and all participants study in Sport and Recreation Management in THEi, had no injury in the past three month, 18 years old or above. There were seven participants were using right leg as dominant leg, while two participants were using left leg as dominant leg. The clothing of the participants had specific requirement, which they need to wear tight clothing. Subjects were informed of the risk of the experience and signed the informed consent form. Also, the investigation was approved by a Human Subjects Ethics Sub-committee (HSESC).

Procedure

As limited source and references in tire flip area, the flipping weight of the tire for recreational athletes is uncertainty. Therefore, pilot test was arranged before the test begins, so as to confirm the weight of tire. The tire was 87 kg, with 120 cm diameter and 40 cm height.

First, for the practical session, the participants had learnt the three tire flip technique, to ensure the technique apply in the experimental was unity. The practical session was also a screening day for the participants, the participants must be able to flip the tire, and able to complete the experimental task in the experimental day. Also, the informed consent form had been signed in this session and the measurement of participants' body weight, body height, and segment length had also done on the practical session. In addition, it was a dress code rehearsal, to ensure the participants can have proper wear on the experimental day.

The three tire flipping technique had recommended by the National Strength & Conditioning Association (NSCA) had been followed in this study (2016), including sumo style, backlift style and shoulders-against-the-tire technique.

For the sumo style, the starting position is standing like the traditional sumo deadlift with wider stance, and the arms should position in a narrower grip (Haff & Triplett, 2016). Using the technique involved in powerlifters during deadlift to raise up the tire above the hip or chest height, at this moment, the hands need to reposition and followed by a pressing to forward (Refer to Fig. 1).

For the backlift style, the technique using in backlift style is similar with sumo style, but the standing width of backlift style is using a narrower, which like the traditional deadlift position. So, the starting position should be feet separate with hip-width, knee and hip knee, the hands grad the tire' base and perform a pull action like the deadlift. After the tire raised, reposition the hands and ending with a forward pressing (Refer to Fig. 2).

For the shoulder-against-the-tire technique, the athletes need to bend his knee behind the tire, and ankles dorsiflex with hid-width path, at the same time, the shoulder and chin should place like the barbell front squat. The hand should supinated grip the tire, while the width of gripping position need to depend on the size of tire, for example, a narrower grip to flip a wider tire. Moreover, the forefoot should stay on the floor and keep ankle dorsiflexion, also transfer the center of mass forward so that athlete should lean forward and lie on the tire. To raise the tire up, athlete need extend his knees and hips followed by ankle plantarflexion. The athlete should flex the hip of one side forcefully when the tire above the hip level, then hit the tire with quadriceps, which can product an upward momentum of the tire. At this moment, the athlete needs to reposition his hand to push the tire with step the foot toward the tire (Refer to Fig. 3).

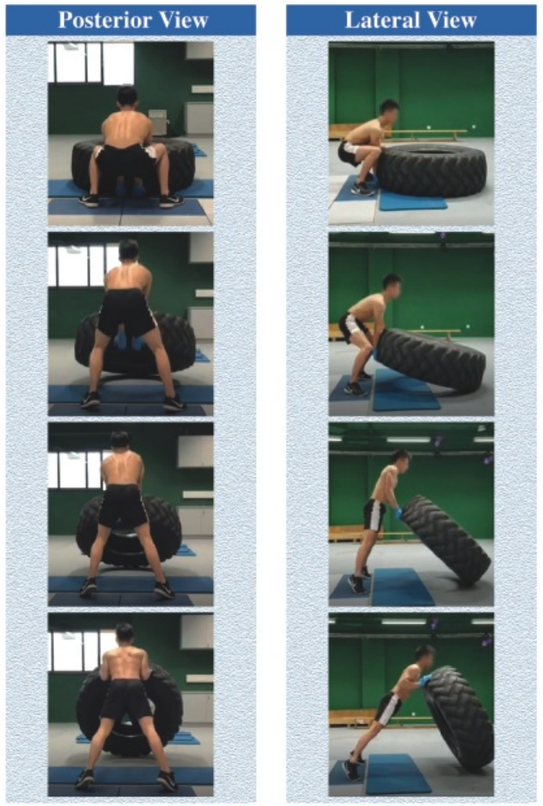


Figure 1. Flipping technique of sumo style

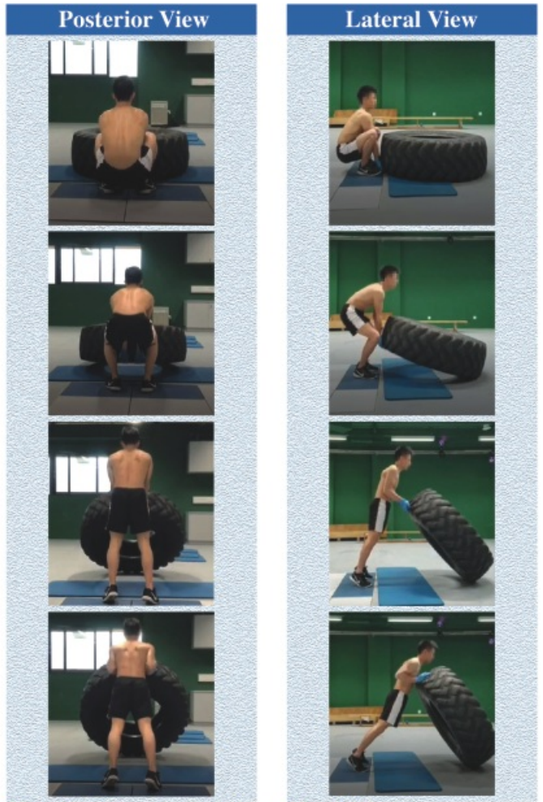


Figure 2. Flipping technique of backlift style

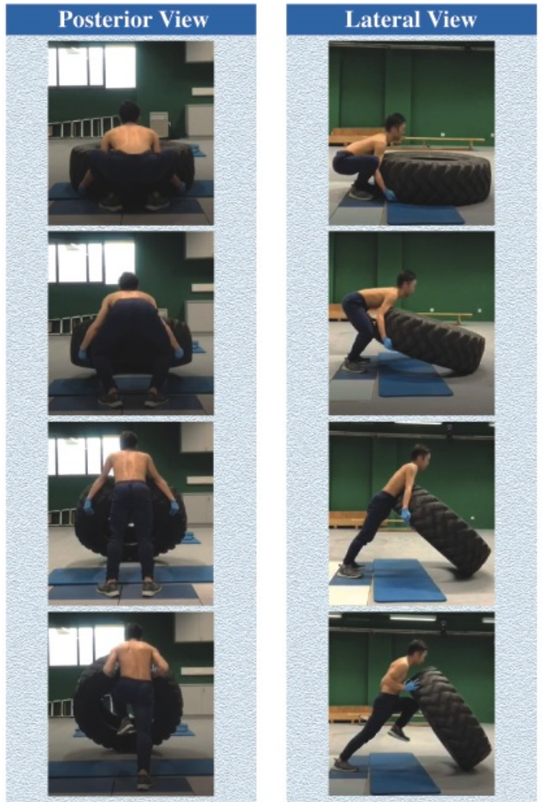


Figure 3. Flipping technique of shoulder-against-the-tire technique

Second, for the experimental session, the participants had marked the position of marker before warm up, which can reduce the time of marking after the warm up session, and prevent the participants cool down due to waiting for the process. The participants had completed a warm session before the experimental, which consisted body weight squats, lunges, pushups, leg raises, dumbbell swings, and chin ups with ten repetitions per each movement (Even-Esh, 2010).

After completed the warm up session, participants had to put on the body marker immediately. Then, the participants had the practical time for tire flipping, which they needed to practice one to two set of tire flips with those three style flipping techniques, and two to four repetitions with moderate rest period between each repetitions or set (Keogh et al., 2010).

Come up into the experimental session, participants had to perform all three tire flip style with random sequence. Each trial involved two repetitions for each style to evaluate intra-trial reliability (Swinton, Lloyd, Keogh, Agouris, & Stewart, 2012). The six trials had performed in a randomized order with three minutes rest period (Keogh et al., 2010; Swinton et al., 2012). Finished all the style, there were a cool down session for the participants, which stretching the related muscles.

Data Collection and Instruments

Force platform and motion analysis system had been used during the experimental to collect the data. The force platform (1000Hz) were collected the data of the peak and average ground reaction force of analyse phase for three flipping techniques. While using Vicon motion analysis system (100Hz) to collect the ankle, knee, and hip joint angular velocity and joint range when the tire lift off the ground to the hip level for these three techniques (Vicon, 2018). Vicon motion analysis system had incorporated with the Active Wand and accessory kits such as reflective markers (sphere 8 mm, base 12 mm), which is a validated calibration tool that increases global system accuracy and is the essentials element to capture the body movement respectively (Vicon, 2018).

Statistical Analysis

Standard descriptive statistics (mean, standard deviations) were calculated for the dependent variables. An a-priori within-subject analysis was done to determine the parameters are normally distribution or not, thus to define parametric or non-parametric. For parametric variables, using repeated measure to compare the different between sumo style, backlift style and shoulders-against-the-tire technique, then, using the paired sample t-test to compare which pair flipping technique have significant difference. For non-parametric variables, using Friedman test to compare the different between those three techniques, then using the non-parametric two related sampled test, with Wilcoxon test type, to determine which pair of style have significant difference. Statistical significance was accepted at $P < 0.05$. All statistical procedures are using the IBM Statistical Package for the Social Sciences (SPSS, Version 24.0, SPSS Inc., Chicago, IL).

Results

Descriptive characteristics of all participants are presented in Table 1.

Table 1. Demographics Measures for Participants (n=9)

Demographics	Age (y)	21.9 ± 2.2
	Height (cm)	170.6 ± 5.2
	Body Mass (kg)	66.8 ± 7.5

Note. Data expressed as mean ± SD.

Average Normalized Ground Reaction Force

The kinetics data can be observed in Table 2. The kinetic differences were found in right leg between those three flipping technique, including sumo style, backlift style, and shoulder-against-the-tire technique. The backlift style (7.852 ± 0.286 N/kg) was produced the highest average normalized ground reaction force, followed by sumo style (7.332 ± 0.346 N/kg), finally was shoulder-against-the-tire-technique (6.748 ± 0.469 N/kg). For the differences in right leg, the backlift style was 0.520 N/kg larger than sumo style (paired samples t-test, t = -2.907, 8 d.f., $p < 0.05$), the backlift style was 1.104 N/kg larger than shoulder-against-the-tire technique (paired samples t-test, t = 6.685, 8 d.f., $p < 0.05$), and the sumo style was 0.584 N/kg greater than shoulder-against-the-tire technique (paired samples t-test, t = 3.303, 8 d.f., $p < 0.05$). However, there was no significant differences apparent in left leg between each style.

Table 2. Average Normalized Ground Reaction Force of the Sumo Style, Backlift Style, and Shoulder-against-the-tire technique

	Sumo Style	Backlift Style	Shoulder-against-the-tire technique
Left Leg (N/kg)	7.088 ± 0.672	7.557 ± 0.505	7.161 ± 0.485
Right Leg (N/kg)	7.332 ± 0.346[a,c]	7.852 ± 0.286[a,b]	6.748 ± 0.469[b,c]

Note. The study had involved nine subjects (n = 9), with age 21.9 ± 2.2 y, height 170.6 ± 5.2 cm, and body mass 66.8 ± 7.5 kg.

Data expressed as mean ± SD.

a. Significant difference between Sumo style and Backlift style
b. Significant difference between Backlift style and Shoulder-against-the-tire technique
c. Significant difference between Shoulder-against-the-tire technique and Sumo style

Peak Normalized Ground Reaction Force

Significant differences only found in right leg between sumo style and backlift style (Wilcoxon test, $p < 0.05$), which the peak normalized ground reaction force of sumo style was 0.659 N/kg lower than that of backlift style. Other than that, there was no significant disparity in left leg among those three flipping techniques, the detail kinetics data had been show in Table 3. To compare the peak normalized ground reaction force in both left and right leg, the backlift style produced the greatest force per mass, followed by sumo style, then shoulder-against-the-tire technique (Left leg: 10.531 ± 0.630 N/kg > 9.977 ± 0.845 N/kg > 9.864 ± 0.987 N/kg; Right leg: 10.985 ± 0.601 N/kg > 10.326 ± 0.879 N/kg > 9.867 ± 1.055N/kg).

Table 3. Peak Normalized Ground Reaction Force of the Sumo Style, Backlift Style, and Shoulder-against-the-tire technique

	Sumo Style	Backlift Style	Shoulder-against-the-tire technique
Left Leg (N/kg)	9.977 ± 0.845	10.531 ± 0.630	9.864 ± 0.987
Right Leg (N/kg)	10.326 ± 0.879[a]	10.985 ± 0.601[a]	9.867 ± 1.055

Note. The study had involved nine subjects (n = 9), with age 21.9 ± 2.2 y, height 170.6 ± 5.2 cm, and body mass 66.8 ± 7.5 kg.

Data expressed as mean ± SD.

a. Significant difference between Sumo style and Backlift style
b. Significant difference between Backlift style and Shoulder-against-the-tire technique
c. Significant difference between Shoulder-against-the-tire technique and Sumo style

Joint Range

The joint ranges performed in sumo style, backlift style, and shoulder-against-the-tire technique was similar, in term of both left and right ankle, knee, and hip, which from the tire lift the ground to the hip level. The detail data had showed in the Table 4.

Table 4. Joint Range of the Sumo Style, Backlift Style, and Shoulder-against-the-tire Technique

	Sumo Style	Backlift Style	Shoulder-against-the-tire technique
Left Leg			
Ankle Joint (deg)	50.762 ± 16.370	51.890 ± 21.342	41.377 ± 13.572
Knee Joint (deg)	109.536 ± 12.941	112.686 ± 12.912	113.851 ± 15.261
Hip Joint (deg)	112.994 ± 10.686	111.520 ± 14.246	114.333 ± 25.252
Right Leg			
Ankle Joint (deg)	36.449 ± 15.665	37.437 ± 13.707	31.054 ± 11.959
Knee Joint (deg)	105.138 ± 12.163	110.395 ± 13.194	111.150 ± 16.863
Hip Joint (deg)	110.255 ± 15.265	108.734 ± 18.690	112.011 ± 24.016

Note. The study had involved nine subjects (n = 9), with age 21.9 ± 2.2 y, height 170.6 ± 5.2 cm, and body mass 66.8 ± 7.5 kg.

Data expressed as mean ± SD.

a. Significant difference between Sumo style and Backlift style
b. Significant difference between Backlift style and Shoulder-against-the-tire technique
c. Significant difference between Shoulder-against-the-tire technique and Sumo style

Average Angular Velocity

Significant differences existed in the average angular velocity including both left and right side of knee joint and hip joint between the backlift style and shoulder-against-the-tire technique. To compare the backlift and shoulder-against-the-tire technique in term of knee joint, the left and right knee joint average angular velocity of backlift style was 30.195 and 31.278 deg/s higher than that of shoulder-against-the-tire technique respectively (Wilcoxon test, $p < 0.05$). While the left and right hip joint average angular velocity of backlift style was 29.562 and 28.985 deg/s higher than that of shoulder-against-the-tire techniques (Wilcoxon test, $p < 0.05$). To compare those three flipping techniques, the backlift style generated the greatest average angular velocity in all parameters including ankle, knee, and hip joint, followed by shoulder-against-the-tire technique, and finally sumo style. For the detail mechanical demand had been show in Table 5.

Table 5. Average Angular Velocity of the Sumo Style, Backlift Style, and Shoulder-against-the-tire Technique

	Sumo Style	Backlift Style	Shoulder-against-the-tire technique
Left Leg			
Ankle Joint (deg/s)	-7.530 ± 91.910	-43.821 ± 16.842	-28.440 ± 8.228
Knee Joint (deg/s)	-59.785 ± 145.359	-108.517 ± 13.658[b]	-78.322 ± 20.057[b]
Hip Joint (deg/s)	-69.355 ± 142.778	-113.992 ± 23.012	-84.430 ± 25.956
Right Leg			
Ankle Joint (deg/s)	-2.918 ± 84.568	-34.214 ± 17.163	-20.305 ± 9.848
Knee Joint (deg/s)	-61.152 ± 131.108	-112.842 ± 19.946[b]	-81.564 ± 15.400[b]
Hip Joint (deg/s)	-80.671 ± 101.806	-113.495 ± 26.976[b]	-84.510 ± 22.727[b]

Note. The study had involved nine subjects (n = 9), with age 21.9 ± 2.2 y, height 170.6 ± 5.2 cm, and body mass 66.8 ± 7.5 kg.

Data expressed as mean ± SD. Negative value meant extension movement

d. Significant difference between Sumo style and Backlift style
e. Significant difference between Backlift style and Shoulder-against-the-tire technique
f. Significant difference between Shoulder-against-the-tire technique and Sumo style

Peak Angular Velocity

The detail mechanical of the peak angular velocity had been show in Table 6. To compare sumo style and shoulder-against-the-tire technique, both left and right knee joint of sumo style were significantly higher than that of shoulder-against-the-tire technique, which was 80.433 deg/s (paired samples t-test, t = -3.676, 8 d.f., $p < 0.05$) and 73.751 deg/s (paired samples t-test, t = -5.765, 8 d.f., $p < 0.05$) respectively. Also, both left and right hip joint of sumo style were also obviously higher than that of shoulder-against-the-tire technique, which was 57.258 deg/s (paired samples t-test, t = -3.520, 8 d.f., $p < 0.05$) and 43.963 deg/s (paired samples t-test, t = -2.617, 8 d.f., $p < 0.05$) respectively.

Moreover, to compare backlift style with shoulder-against-the-tire technique, in term of knee joint, both left and right peak angular velocity of backlift was 58.76 deg/s (paired samples t-test, t = -2.540, 8 d.f., $p < 0.05$) and 53.288 deg/s (paired samples t-test, t = -4.571, 8 d.f., $p < 0.05$) larger than that of shoulder-against-the-tire technique respectively. Other than that, in term of hip joint, both left and right peak angular velocity of backlift was 66.975 deg/s (paired samples t-test, t = -3.280, 8 d.f., $p < 0.05$) and 56.060 deg/s (paired samples t-test, t = -2.729, 8 d.f., $p < 0.05$) larger than that of shoulder-against-the-tire technique respectively. Therefore, there were significant differences in peak angular velocity for left and right knee, and left and right hip between sumo style and backlift style, and backlift style and shoulder-against-the-tire technique. However, there were no obvious differences had been found among those three styles in term of both left and right ankle joints.

Table 6. Peak Angular Velocity of the Sumo Style, Backlift Style, and Shoulder-against-the-tire Technique

	Sumo Style	Backlift Style	Shoulder-against-the-tire technique
Left Leg			
Ankle Joint (deg/s)	-209.203 ± 90.251	-208.946 ± 57.208	-197.310 ± 71.288
Knee Joint (deg/s)	-284.991 ± 45.360	-263.318 ± 46.927[b]	-204.558 ± 34.516[b,c]
Hip Joint (deg/s)	-267.837 ± 56.859	-277.554 ± 63.872[b]	-210.579 ± 38.257[b,c]
Right Leg			
Ankle Joint (deg/s)	-163.568 ± 83.190	-169.870 ± 88.913	-127.100 ± 47.919
Knee Joint (deg/s)	-270.242 ± 40.704	-249.779 ± 39.251[b]	-196.491 ± 27.702[b,c]
Hip Joint (deg/s)	-248.496 ± 56.107	-260.593 ± 62.313[b]	-204.533 ± 34.328[b,c]

Note. The study had involved nine subjects (n = 9), with age 21.9 ± 2.2 y, height 170.6 ± 5.2 cm, and body mass 66.8 ± 7.5 kg.

Data expressed as mean ± SD. Negative value meant extension movement

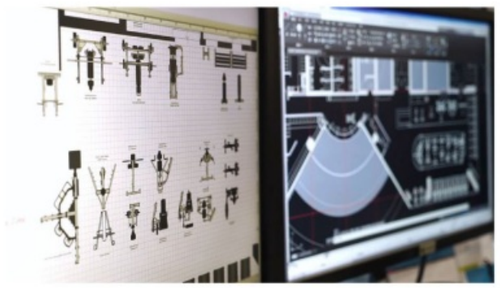
a. Significant difference between Sumo style and Backlift style
b. Significant difference between Backlift style and Shoulder-against-the-tire technique
c. Significant difference between Shoulder-against-the-tire technique and Sumo style

Life Fitness 至今已成立 50 年，一直以來致力為不同人士提供專業健身器材、地板及度身訂造的健身室方案。

屋苑會所健身室項目更是我們主力服務的市場之一。Life Fitness 明白香港人的生活步伐緊湊、繁忙。完善的屋苑健身室能為他們提供一個方便且優質的健身場地。為此，我們與各大發展商及物業管理公司緊密合作，為各類型屋苑度身設計其最合適的健身室、為發展商提供樓宇預售支援、為物業管理公司員工提供健身室保養及營運工作坊、更有完善的售後服務及產品使用培訓，令住戶擁有更優質的生活。

用心打造

每一個健身室都是獨特的，Life Fitness 專業的銷售團隊與室內設計師緊密合作，在有限的空間發揮無限的可能。每一台器材的擺放位置、器材的數量和種類的配搭都是根據專家建議及豐富經驗而決定的。銷售團隊會再將抽象的概念以高科技繪圖工具圖象化，令大家對未來的健身室有一個清晰的畫面。



樓宇預售支援

Life Fitness 知道樓宇預售對發展商及買家的重要性，因此，在健身室設計及設備配搭方面，我們會作出最大的支援。例如我們會協助發展商在樓宇預售的記者發佈會介紹會所健身室設施，令買家更容易了解健身室的設備及其獨特之處。

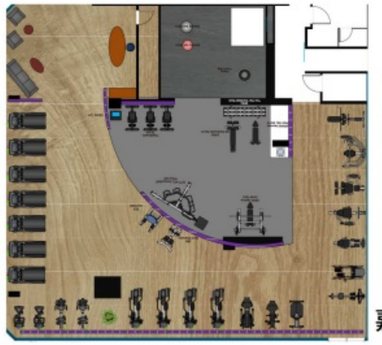
產品使用訓練

當健身室器材安裝工程完成後，Life Fitness 會安排專業的教練到各會所健身室進行產品使用培訓，深入淺出地令到會所及健身室的相關工作人員能清楚了解各樣器材的用途、使用方法及注意事項。

培訓工作坊

除了以上服務，Life Fitness 更定時為物業管理人員及教練提供培訓工作坊。Life Fitness 亞太區總部具備最先進的健身設備及科技，為物業管理人員提供相關培訓，令他們能更了解其會所健身室的設計、器材數量和選擇的原因，有效的管理方法，從而能更好地管理和提供優質服務予屋苑住戶。我們還會為他們安排健身時段，讓他們對器材和健身室的設計有更深刻的體驗。

項目分享



嘉匯（啟德）

濠庭都會（澳門）

重點屋苑項目

柏蔚山（北角）
海璇（北角）
香島（筲箕灣）
全．城滙（荃灣）
柏傲灣（荃灣）
嘉匯（啟德）
薈蕎（沙田）
富豪．山峯（沙田）
傲瀧（西貢）
藍塘傲（將軍澳）
豐連（屯門）
濠庭都會（澳門）

關於 LIFE FITNESS 產品及服務，歡迎與我們查詢。
電話：852.2575.6262
電郵：hongkong.sales@lifefitness.com
地址：**香港黃竹坑道 21 號環匯廣場 32 樓**
網址：www.lifefitness.com.hk

lifefitnesshongkong

精彩活動分享

Discussion and Conclusion

The aim of the present study was to investigate the biomechanical similarity and differences between three types of tire flip techniques, including sumo style, backlift style and shoulder-against-the-tire technique, in term of the normalized ground reaction force, joint range, and angular velocity of the ankle, knee, and hip joints. As there was only few researches had been done on strongman event, especially in the tire flip area. While more and more strength and conditioning training apply tire flip training as one of the exercise, however, there was lack of support of the exercise selection, which may indicate wrong matching with the tire flip for specific sports. Also, wide training outcome may result in different coaches' approach. Therefore, this study can find out the difference between those three flipping style, determine which style produce the greatest force, and fastest flipping. So that to provide a critical and scientific basis for selecting the flipping style with specific need in the sports and incorporate with the strength and conditioning training.

The results of the present study indicated that there was no significant difference among those three types of flipping style, in term of normalized ground reaction force and angular velocity in ankle, knee, and hip joints. In fact, only the peak and average normalized ground reaction force in left leg were similar among those three styles. There is obvious different of average normalized ground reaction force in right leg while performing three technique (Backlift style > Sumo style > Shoulder-against-the-tire technique) ($P < 0.05$), while differences in right leg only found between sumo style and backlift style in term of peak normalized ground reaction force (Backlift style > Sumo style) ($P < 0.05$). Moreover, the differences in average angular velocity occurred in backlift style and shoulder-against-the-tire technique in knee and hip joints, while differences between sumo and shoulder-against-the-tire technique, and backlift and shoulder-against-the-tire found in knee and hip joints. Also, the result had indicated that there were similarity in joint range among three flipping style, and in peak and average angular velocity between sumo style and backlift style.

The results showed that the average and peak normalized ground reaction force in left leg were similar among three types of flipping style. While the average normalized ground reaction force of right leg was different among the style ($P < 0.05$), which may related with dominant leg of the subject. In the experiment, there were seven subjects using right leg as dominant leg (77.8%), in the shoulder-against-the-tire technique, all subjects had standardized to using left leg to perform the hip flexion when the tire above the hip level, while the right leg remain on floor, then hit the tire with quadriceps, thus to product an upward momentum of the tire. According to "Biomechanical symmetry in elite rugby union players during dynamic tasks: an investigation using discrete and continuous data analysis techniques" (Marshall, et al., 2015), the study had examined the biomechanical symmetry in elite rugby union athletes, which found that there were obvious difference between the dominant leg and non-dominant legs, in term of the peak variable magnitude, asymmetry index and the result of the dynamic task ($p < 0.05$). Moreover, in another research "Bilateral and unilateral vertical ground reaction forces and leg asymmetries in soccer players" (Yanci & Camara, 2016), also showed that while using dominant and non-dominant leg to perform the counter movement jump were significant differences ($p < 0.05$). Therefore, the subjects may tend to use the dominant leg as the main source of force production, as the strength of dominant leg is greater than non-dominant leg, so that induced higher normalized ground reaction force on right leg rather than left leg.

The results showed that the peak normalized ground reaction force in backlift style was larger different with sumo style ($P < 0.05$). According to "A Biomechanical Analysis of the Strongman Log Lift and Comparison with Weightlifting's Clean and Jerk" (Winwood, Cronin, Brown, & Keogh, 2015), the study stated that the weightlifting exercises were commonly involved in the power training, since the biomechanics of the exercises let the players produce high forces at high velocities, which aim to raise the capability of power. Therefore, since backlift style produced the highest peak normalized ground reaction force, this style may be an efficient tire flip style to stimulus the improvement of force production, and beneficial for improving athletic performance (Winwood, et al., 2015).

Other than that, the differences found between sumo style and backlift style was surprisingly, the peak normalized ground reaction force of backlift was greater than sumo style, since the both flipping movement were similar, the main different was the foot position, for sumo style perform in wide stance with narrow grip, while the backlift style perform in the narrow stance with narrow grip. According to "A three-dimensional biomechanical analysis of sumo and conventional style deadlifts" (Escamilla, et al., 2000), there was an analysis about the kinematic and kinetic of sumo deadlift and conventional deadlift. It stated that sumo deadlift is performing with shorter range of motion (20-25%) than the conventional deadlift (Nuckols, et al., 2017), which mean the conventional deadlift need more mechanical work to flip the tire over (Escamilla, et al., 2000). Moreover, study also point out one important point about the hip extension in the three dimensional analyses; both sumo deadlift and conventional deadlift require similar hip extension torque to perform the movement, no significant difference in the demands of hip extension (Escamilla, et al., 2000). The authors stated the difference in sumo and convention deadlift were sumo deadlifts need three time more of knee moment than convention deadlift when the bar just left the floor, which harder on the quadriceps (Escamilla, et al., 2000), and conventional deadlift with narrow stand harder on the spinal erector when the bar lift up (Escamilla, et al., 2000). Also, it concluded convention deadlift is harder to perform, as the starting position of lift, the torso need to tilt forward, while need to contract the spinal erectors to maintain the back extension (Escamilla, et al., 2000). Therefore, the Escamilla's study helps to understand and explain the stand width different occurred in present study, since the wider stand of sumo style require less force to lift the tire off the ground, so it required less ground reaction force than backlift style.

The angular velocity is a measurement of how quick the joint moves through an angle, which calculated by the change in angular displacement divided by change in time (TutorVista.com, 2018). In the result, the average angular velocity of backlift in knee and hip joint was significantly faster than shoulder-against-the-tire, while the joint ranges were similar among three tire flip techniques. Therefore, since no significant different in joint range, the higher angular velocity can represent shorter time to finish the movement, while lower angular velocity can represent the movement take longer time to finish from floor to hip level (National aeronautics and space administration, 2015). Although the parameters analyzed within the study did not include the duration of tire flipping from lift off to hip level, the lower average duration of movement reflect longer duration of movement, therefore, the shoulder-against-the-tire got longer duration to lift the tire off the ground to the hip level.

The results showed that sumo style and backlift style was similar in peak angular velocity of knee and hip joints, while the shoulder-against-the-tire was more different with other two tire flipping style. The results revealed that the peak angular velocity in both left and right knee and hip joints of backlift style and sumo style were larger than that of shoulder-against-the-tire technique. The greatest peak angular velocity of knee joint was generated by sumo style, followed by backlift, finally shoulder-against-the-tire technique. The greatest peak angular velocity of hip joint was backlift style, followed by sumo style, finally shoulder-against-the-tire technique. Shoulder-against-the-tire technique flips the tire from floor to hip level performed lowest peak angular velocity than other two styles.

Conclusion

In conclude, the results showed the biomechanical similarity and differences among the three types of tire flip techniques, including sumo style, backlift style and shoulder-against-the-tire technique, in term of the normalized ground reaction force, joint range, and angular velocity of the ankle, knee, and hip joint. a) The dominant and non-dominant leg was one of the element affect the normalized ground reaction force. Dominant leg was able to produce a higher average normalized ground reaction force than the non-dominant leg. b) Backlift style may better generate the peak normalized ground reaction force than sumo style, which may be the better flipping style to stimulus the improvement of force production, and beneficial for improving athletic performance. c) The results provided insight into the kinematics of three type of tire flip style, such as joint angle and stance width between sumo style and backlift style. d) Shoulder-against-the-tire techniques need the longest duration to take off the tire from the ground to hip level. e) Sumo style and backlift style had a similar peak angular velocity for lifting from ground to hip level, in term of both left and right knee and hip joint. Future studies in the biomechanical area are needed to get more insight on the flipping techniques and comparison between three types of tire flip style and weight training exercise such as deadlift, it can compare the advantage bring from strongman exercise and weight training exercise and more information for the coaches to implement the strongman exercise such as tire flip incorporate with the strength and conditioning training programme. RMA

References

Baker, D. (2008) . Strongman training for large groups of athletes. *J Austr Strength Cond, 16, 33*.

Berning, J. M., Adams, K. J., Climstein, M., and Stamford, B. A. (2007) Metabolic demands of "junkyard" training: pushing and pulling a motor vehicle. *J Strength Cond Res.,21, 853-856*.

Bullock, J. B., & Aipa, D. M. (2010) . Coaching Considerations for the Tire Flip. *Strength and Conditioning Journal, 32(5), 75-78*.

Cornell, D., Ebersole, K., & Mim, J. (2011) . Tire flipping – a method of assessing functional power output for firefighters. *NSCA'S TSAC Report, 37, 4-6*.

Cronin, J., & Keogh, J. (2015) . Strongman implement training: applications for strength and conditioning practice. *Auckland University of Technology*.

Escamilla, R. F., Francisco, A. C., Fleisig, G. S., Barrentine, S. W., Welch, C. M., Kayes, A. V., Andrews, J. R. (2000). A three-dimensional biomechanical analysis of sumo and conventional style deadlifts. *Medicine & Science in Sports & Exercise, 32(7),* 1265-127doi:10.1097/00005768-200007000-00013

Even-Esh, Z. (2010). FLIP FOR STRENGTH!. *Men's Fitness, 26(5), 30-31*

Ghigiarelli, J., Sell, K., Raddock, J., & Taveras, K. (2013) .The effects of strongman training on salivary testosterone levels in a sample group of trained males. *Journal of Strength & Conditioning Research, 27*(3), 738-747. doi:10.1519/jsc.0b013e3182578115

Haff, G. G., & Triplett, T. N. (2016) . *Essentials of Strength Training and Conditioning*. (4th ed.) National Strength and Conditioning Association, ISBN-13: 9781492501626.

Hales, M. (2010). Improving the *Deadlift: Understanding Biomechanical Constraints and Physiological Adaptations to Resistance Exercise*. Strength and Conditioning Journal, 32(4), 44-51. doi:10.1519/ssc.0b013e3181e5e300

Havelka, J. (2004) . *Personal best: how to train for the sport of strongman*. Portland: Authors Books and Publishing.

Hedrick, A. (2003) . Using uncommon implements in the training programmes of athletes. *Strength Cond J, 25, 18-22*.

Keogh, J. W., Payne, A. L., Anderson, B. B., & Atkins, P. J. (2010) . A brief description of the biomechanics and physiology of a strongman event: the tire flip. *J Strength Cond Res, 24(5)*, 1223-1228.doi: 10.1519/JSC.0b013e3181cc61cd

Marshall, B., Franklyn-Miller, A., Moran, K., King, E., Richter, C., Gore, S., Falvey, É. (2015). Biomechanical symmetry in elite rugby union players during dynamic tasks: An investigation using discrete and continuous data analysis techniques. BM*C Sports Science, Medicine and Rehabilitation,* 7(1). doi:10.1186/s13102-015-0006-9

McGill, S. M., McDermott, A., and Fenwick, C. M. J. (2009) . Comparison of different strongman events: trunk muscle activation and lumbar spine motion, load, and stiffness. J Strength Cond Res, 23, 1148-1161.

Sellers, J., & Ruedy, Z. (2015). Coaching and Implementing the Tire Flip Exercise Into a Strength and Conditioning Program. Strength and Conditioning Journal, 37(6), 109-112. doi:10.1519/ssc.0000000000000174

Swinton, P. A., Lloyd, R., Keogh, J.W., Agouris, I. & Stewart, A. D. (2012) . A biomechanical comparison of the traditional squat, powerlifting squat and box squat. *Journal of Strength and Conditioning Research Publish Ahead of Print, 26*(7), 1805-1816.

Waller, M., Piper, T., & Townsend, R. (2003) . Strongman events and strength and conditioning programs. *Strength and Conditioning Journal,* 25(5), 44-52.

Winwood, P. W. (2011). *Strongman: strength and conditioning practices, and the inter-relationships between strength, anthropometrics and performance* (Doctoral dissertation, Auckland University of Technology).

Winwood, P. W., Cronin, J. B., Brown, S. R., & Keogh, J. W. (2015). A Biomechanical Analysis of the Strongman Log Lift and Comparison with Weightliftings Clean and Jerk. *International Journal of Sports Science & Coaching,* 10(5), 869-886. doi:10.1260/1747-9541.10.5.869

Winwood, P.W., Keogh, J. W., & Harris, K. (2011) . The strength and conditioning practices of strongman competitions. *The Journal of Strength and Conditioning Research, 25*(11), 3118-3128.

Yanci, J., & Camara, J. (2016). Bilateral and unilateral vertical ground reaction forces and leg asymmetries in soccer players. *Biology of Sport,* 33(2), 179-183. doi:10.5604/20831862.1198638

References from Webpage

TutorVista.com. (2018). Angular Velocity Formula Retrieved 5 May, 2018, from: https://formulas.tutorvista.com/physics/angular-velocity-formula.html

Even-Esh Zach. (2010). Tractor Tire Flips. Retrieved 8 December, 2017, from: https://www.mensfitness.com/training/tractor-tire-flips

Nuckols, G., Nuckols, G. N., Richardson, K. (2017). Should you Deadlift Conventional or Sumo? • *Stronger by Science*. Retrieved 5 May, 2018, from: https://www.strongerbyscience.com/should-you-deadlift-conventional-or-sumo/

Poliquin, C. R. (2017). Increase Ankle Flexibility *for Squats and Deadlifts*. Retrieved 10 May, 2018, from: http://www.strengthsensei.com/ankle-flexibility-squats-deadlifts/

Vicon. (2018). *Vicon Devices Size, Performance,* Clarity. Retrieved 5 May, 2018, from: https://www.vicon.com/products/vicon-devices

National aeronautics and space administration. (2015). *Angular displacement, velocity,* acceleration. Retrieved 5 May, 2018, from: https://www.grc.nasa.gov/www/k-12/airplane/angdva.html

INTRODUCTION

An enduring and essential element of collegiate recreational sports programs is an emphasis on providing high quality, high impact programs and services. In addition, participants in collegiate recreation settings have an expectation to receive benefits because of their participation. These high-quality programs and services and expectations of benefits have a relationship to the participant's interaction with staff working in recreational sports settings (Miller, 2000, p. 63; Mawson, 1993, p. 101). Therefore, service quality is often viewed as an essential element which is reflected in the mission of recreational sports programs.

Rapid development and expansion of recreational sports programs on college and university campuses over the past 150 years has occurred (NIRSA, 2009, p. 5). These programs provide a wide array of services including intramural sports activities, fitness programs, outdoor pursuits, aquatics and others (Lindsey, 2012; Young, Ross & Barcelona, 2003). Over time, terms used to define sponsoring administrative units which provide such services have been known as intramural sports, campus recreation, recreational services, and wellness services. In this study, the term "recreational sports" has been adopted as it is the most widely used and identified name in the literature.

As Parasuraman, Zeithaml and Berry (1988) state in emphasizing the importance of service quality ". . . delivering superior service quality appears to be a prerequisite for success, if not survival, of such businesses in the 1980's and beyond" (p. 13). The concept of service quality continues to be a dominant and important management factor which is studied and is prominent in the literature. Ipson, Rehman and Stegen (2010) state the value of service quality, especially as it relates to future marketing of programs is that ". . . exceptional service helps retain customers, attracts more customers, and develops an organization reputation that induces customers and prospects alike to do business with the organization in the future" p 372.

In addition, Ipson et al. (2010) discuss the necessity of using research to further the understanding of perceived dimensions of service quality. They note that "... measures of service quality can be calculated, gaps in the services provided can be identified, and the organization can tell whether its customer's expectations are being met" (p. 372).

Elements in the study of dimensions in service quality usually include the facility where one's leisure experience occurs as well as the interaction with staff within which they engage. Fried (2010) suggests that managers play a key role in managing facilities and personnel. He writes ". . . this is one of the critical skills for a manager- providing the highest level of service possible given the strengths and weaknesses inherent in the facility and its personnel" (p. 31). Aspects of customer service (a pre- cursor to the dimensions of service quality) in recreational sports were found in the literature as early as the 1960's. As Mueller and Mitchell (1960) have suggested, there has been a "… focus on staff, facilities and equipment and the need for continuously expanding and improving these program and services components" (p. 25). However, significant research work in dimensions of service quality specific to recreation settings did not occur until well into the 2000s. Seminal work in service quality in the marketing literature reveal that Parasuraman et al. (1985) suggest five dimensions for measuring service quality including: (a) tangibles, (b) reliability, (c) responsiveness, (d) assurance, and (e) empathy.

Use of service quality measures specific to recreational sports was pioneered by Osman, Cole and Vessell in 2006 closely followed by the work of Ko and Pastore (2007) and most recently by Shonk, Carr and DeMichelle (2010). Osman et al. (2006) studied service quality, user satisfaction and behavior intentions while Ko and Pastore (2007) developed the Scale for Services Quality in Recreational Sports (SSQRS). Shonk and his colleagues (2010) studied service quality, user satisfaction and social identity using the SSQRS.

Ko and Pastore (2007) have suggested that there are four dimensions of service quality: (a) program quality; (b) interaction quality; (c) outcome quality; and (d) the physical environment. These four dimensions were supported by 11 program attributes including: (a) range of program; (b) operational times; (c) information; (d) client-employee interaction; (e) inter-client interaction; (f) physical change; (g) valence; (h) sociability; (i) ambient condition; (j) design; and (k) equipment.

As noted, perceived recreational benefits is the second dimension of the study. Participants seek recreational benefits or the expectations of recreational benefits that maybe derived from one's leisure experiences (Edginton, Hudson, Dieser & Edginton, 2004). Understanding what participant needs and wants are should allow leisure service providers to improve the programs and services offered in the recreational sports setting and more effectively deliver expected benefits.

This study is focused on linking the two management elements: dimensions of service quality and perceived recreational benefits. Although a well-documented body of knowledge exists in recreational sports, service quality and leisure benefits, few studies have investigated the relationship of dimensions of service quality and perceived recreational sports benefits.

The research questions for this study were as follows:

1. What is the relationship between the respondent's perceived dimensions of service quality and recreational benefits?
2. What is the difference between the respondent's institution and the impact on their perceptions of dimensions of service quality and perceived recreation benefits?
3. What is the difference between the respondent's perceptions of dimensions' service quality and program areas such as intramurals, aquatics and fitness?
4. What is the difference between the respondents perceived recreational benefits and program areas such as intramurals, aquatics and fitness?
5. What is the relationship between the respondent's perceptions regarding dimensions of service quality and one's position within their institution (participant type), national origin, gender and ethnicity?
6. What is the relationship between the respondents perceived recreational benefits and one's position within their institution (participant type), national origin, gender and ethnicity?

These research questions were converted in null hypothesis statements for the purpose of statistical testing.

METHODS

The participants were drawn from electronic bases at the three types of academic institutions involved in intramurals, aquatics and fitness) as those are the programs all three institutions have membership categories for: (a) students, (b) faculty and staff, (c) alumni and (d) community members. All three institutions enroll international students and have international faculty and staff. Two groups (US citizen and not- US citizen) will make up the "national origin" category. Race and ethnicity categories employed in the study are: (a) Hispanic or Latino; (b) American Indian or Alaska Native; (c) Asian; (d) Black or African American; (e) Native Hawaiian or Other Pacific Islander; and (f) White.

The instrument utilized in this study was employed to measure the dimensions of service quality and perceived recreational benefits of individuals participating in recreational sports programs. The service quality related questions found on the questionnaire used in this study are based on the Scale of Service Quality in Recreational Sports, developed by Ko and Pastore in 2007. The SSQRS contains four dimensions including: (a) program quality; (b) interaction quality; (c) outcome quality; and (d) physical environment. The program quality dimension is supported by range of programs, operating time, and dissemination of program information. Interaction quality is supported by client-employee interaction and inter-client interaction. Outcome quality is supported by physical change, valence, and sociability. Physical environment is supported by ambient condition, design and equipment. The original SSQRS also included four questions related to satisfaction.

Table 1 presents the Cronbach alpha reliability testing for the 11 sub dimensions found in the SSQRS. Overall, the scale was shown to be very reliable with an alpha score range of .73 to .94.

Table 1

Reliability Measures of the Scale of Service Quality in Recreational Sports

Subdimension	Ko and Pastore Factor (a)
Range of programs	.86
Operating time	.81
Information	.83
Client-employee interaction	.94
Inter- client interaction	.86
Physical change	.92
Valence	.92
Sociability	.88
Ambient condition	.91
Design	.93
Equipment	.73

Note. Ko and Pastore (2007)

The recreational benefits related questions found in the importance-performance analysis are based on the 1991 QIRS instrument. The QIRS was a project commissioned by the NIRSA and developed by the Center for Assessment Research and Development at the University of Tennessee. Table 2 shows the benefits used in the original QIRS study.

Table 2

Quality and Importance of Recreational Services

Factors
Self-confidence
Feeling of physical well-being
Sense of accomplishment
Sense of adventure
Group cooperation skills
Respect for others
Communication skills
Belonging/ association
Leadership skills
Defining problems
Problem-solving skills
Study habits
Weight control
Sports skills
Fitness
Physical strength
Stress reduction
Balance/ coordination
Time-management skills
Developing friendships
Understanding written information
Handling several tasks at once

Note. NIRSA QIRS benefit factors.

FINDINGS

Reporting of Results

An analysis of the total population (N = 11,301) revealed an overall response rate of 9.7%. After purging incomplete surveys, 750 of the 1094 surveys were usable for the purposes of this study. The three programs populations included: (a) Intramurals (n = 9,036) 2% response, (b) Aquatics (n = 836) 12.9% response, and (c) Fitness (n = 1429) 23% response rate.

Demographic Information

Gender responses in this study included males (n = 220) and females (n = 404). The liberal arts college (N = 1747) had a gender mix of 53% females and 47% males in 2012. In this study 77% of the respondents from the liberal arts college were female while 33% were male. The comprehensive university (N = 12,273) had a gender mix of 58% female and 42% males in 2012 while 72% of the respondents of this study were female and 28% were male. The research based university (N = 31,498) had a 2012 gender mix of 51% females and 49% males while the respondents to this study included 51% females and 49% males. This study also included faculty/ staff, alumni and community (see Table 3).

The Liberal Arts College in the study reports a minority and international student population of 18.8% while this study included two minority responses accounting for 3% of the responding population of this institution. The liberal arts college does not report IPED minority categories and only reports minority statistics with international student statistics. The comprehensive university reported a 2012 minority student enrollment of 9% while 17 minorities responded to this study accounting for 5% of the responding population from this institution. The research based university reported a 2012 minority student enrollment of 13% while 29 minorities responded to this study accounting for 12% of the responding population of this institution. All three institutions combined accounted for a combined total of 48 minority responses. The low response in the ethnicity category dictated collapsing the data into two categories: (a) minority and (b) Caucasian.

Year in school categories were designated in the survey as: (a) freshman; (b) sophomore; (c) junior; (d) senior; and (e) graduate. A low response dictated collapsing the five categories into under-classman, upper-classman and graduate students. The collapsing of these categories yielded responses of under-classman (n = 67), upper-classman (n = 233) and graduate students (n = 65).

Table 3 shows the number of usable surveys for each of the demographic variables including: (a) gender, (b) program type (intramurals, aquatics and fitness), (c) national origin (US citizen, not US citizen), (d) participant type (student, faculty/ staff, alumni and community), (e) ethnicity (minority and Caucasian), (f) year in school (under-classman, upper-classman and graduate student).

Table 3

Demographic Characteristics by Institution

Variable		LAC (N = 61)	%	Comp (N = 323)	%	R1 (N = 240)	%	Total
Gender (n = 624)	Male	14	23%	89	28%	117	48.7%	220
	Female	47	77%	234	72%	123	51.2%	404
Program Type (n= 624)	Intramurals	19	31%	65	20%	101	42%	185
	Aquatics	15	25%	84	26%	9	3.7%	108
	Fitness	27	44%	174	54%	130	54.1%	331
National Origin (n = 618)	US Citizen	60	98%	314	97%	234	97.5%	608
	Not US Citizen	0	0.0%	6	1.8%	4	1.6%	10
Participant Type (n = 620)	Student	24	39%	172	53.2%	170	70.8%	366
	Faculty/Staff	3	5%	99	30.6%	55	22.9%	157
	Alumni	0	0.0%	37	11.4%	9	3.7%	46
	Community	32	52.4%	15	4.6%	4	1.6%	51
Ethnicity (n = 615)	Minority	2	.3%	17	5.2%	29	12.1%	48
	Caucasian	58	95%	302	93.4%	207	86.2%	567
Year in School (n = 365)	Under-class	6	9%	33	10.2%	28	11.6%	67
	Upper-class	18	29%	116	35.9%	99	41.2%	233
	Graduate	0	0.0%	21	6.5%	44	18.3%	65

Note. LAC = Liberal Arts College; Comp = Comprehensive University; R1 = Research Based University; some categories may not equal 100% as a result of incomplete surveys; year in school category only includes students.

Factor Analysis

This study includes 14 attributes found in the NIRSA QIRS questionnaire. In addition, fun was added as an attribute in this study. A Rotated Component Matrix was used to determine the two factors from these 15 attributes. The Principal Component Analysis and Varimax with Kaiser Normalization method were employed. Results indicated that the social benefit factor includes: (a) communication; (b) leadership; (c) problem solving; (d) group cooperation; (e) respect for others; (f) friendships; (g) adventure; and (h) time management. The personal/ physical benefit factors include: (a) physical strength; (b) stress reduction; (c) weight control; (d) balance and coordination; (e) accomplishment; (f) self-confidence; and (g) fun (p. 36-38) (see Table 4).

Table 4

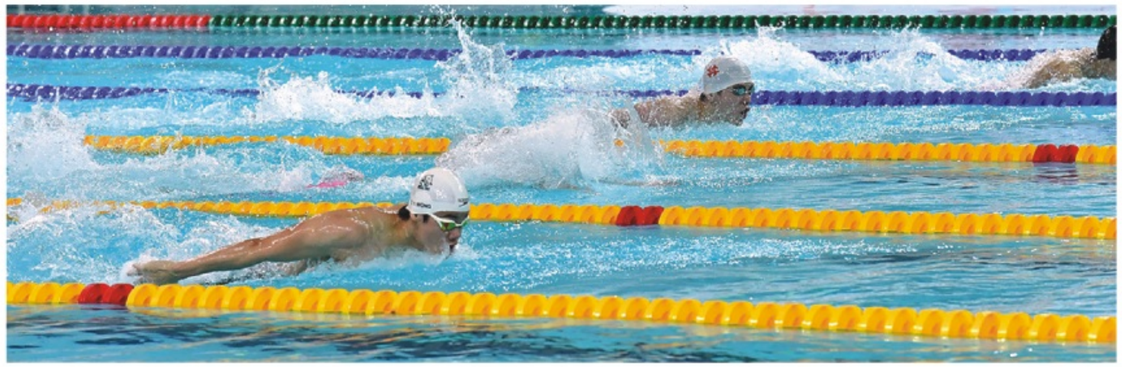
Factors, Attributes, Alpha Scores. Mean Scores and Standard Deviations for Importance and Performance

Factor	Attribute	a (I)	m (I)	sd (I)	a (P))	m (P)	sd (P)
Range of Program (n = 750) I (n = 734) P		.837			.847		
	Offers various programs	.760	4.06	1.034	.798	3.87	.897
	Offers a wide range of classes	.762	4.12	.989	.772	3.85	.884
	Offers popular classes	.830	3.88	1.072	.807	3.92	.906
	Classes are attractive to me	.820	4.11	1.037	.843	3.83	.991
Operating Times (n = 737) I (n = 735) P		.721			.739		
	Operating hours are convenient	.720	4.59	.800	.774	3.87	1.077
	Class times are convenient	.554	4.38	.941	.564	3.54	1.033
	Classes are offered several times	.567	4.30	.886	.613	3.61	1.007
Information (n = 709) I (n = 683) P		.787			.817		.817
	Personnel easy to contact by e-mail	.741	.3.62	1.258	.814	3.75	1.082
	Easy to contact through website	.729	3.89	1.063	.759	3.70	1.043
	Up-to- date information available	.747	4.34	.886	.771	3.84	1.034
	Information is easy to obtain	.745	4.36	.809	.772	3.91	.973
	Easy to contact by phone	.773	3.82	1.161	.789	3.90	1.023
Client-Employee (n = 677) I (n = 656) P		.904			.910		
	Staff knowledge	.896	4.30	.830	.897	3.85	.946
	Staff friendliness	.893	4.36	.799	.902	3.96	.960
	Staff are willing to help	.883	4.39	.820	.893	4.00	.905
	Staff take action when problems occur	.891	4.40	.820	.895	3.92	.929
	Staff are competent	.890	4.46	.766	.892	3.95	.925
	Staff handle problems promptly	.883	4.37	.787	.892	3.88	.916
	Staff deal with special needs of patrons	.896	4.23	.909	.902	3.82	.946

Factor	Attribute	a (I)	m (I)	sd (I)	a (P))	m (P)	sd (P)
Inter-Client		.850			.853		
(n = 674) I							
(n = 666) P							
	Other customers have a positive impact on me	.798	3.71	1.067	.809	3.76	.912
	I'm impressed with other patrons	.794	3.60	1.063	.803	3.70	.958
	Customers follow rules and regulations	.855	4.09	.890	.846	3.85	.918
	Customers leave me with a good impression	.781	3.95	.994	.792	3.89	.918
Physical Change		.934			.929		
(n = 644) I							
(n = 641) P							
	My physical ability level has increased	.930	4.31	.911	.914	4.04	.926
	Programs have improved my physical ability	.914	4.23	.943	.912	3.99	.920
	I have increased my physical fitness level	.912	4.26	.911	.916	4.00	.925
	I have increased my skill level	.920	4.17	.926	.909	3.93	.930
	I have improved my skill performance	.915	4.16	.921	.914	3.94	.954
Valence		.882			.893		
(n = 653) I							
(n = 647) P							
	I feel good about what I get from	.857	4.41	.802	.861	4.09	.889
	I always get what I wanted	.837	4.33	.785	.868	4.94	.911
	I have a good feeling when I leave	.839	4.37	.778	.857	4.16	.841
	I would evaluate the program favorably	.859	4.35	.821	.862	4.19	.835
Sociability		.923			.908		
(n = 630) I							
(n = 625) P							
	Opportunities for social interaction	.905	3.45	1.191	.891	3.64	1.071
	I feel a sense of family among customers	.913	3.12	1.258	.886	3.19	1.165
	I made friends through participation	.888	3.27	1.239	.876	3.26	1.227
	I have enjoyed my social interaction	.894	3.49	1.216	.869	3.55	1.158

Factor	Attribute	a (I)	m (I)	sd (I)	a (P))	m (P)	sd (P)
Ambient Condition		.887			.895		
(n = 627) I							
(n = 625) P							
	The ambience is excellent	.857	4.01	.954	.868	3.92	.908
	The ambience is what I'm looking for	.854	3.90	1.001	.871	3.93	.922
	The facility is clean and well maintained	.893	4.47	.750	.907	4.12	.932
	I'm impressed with the atmosphere	.847	4.10	.887	.853	3.98	.921
	I really enjoy the atmosphere	.855	4.16	.863	.858	4.07	.902
Design		.895			.899		
(n = 610) I							
(n = 605) P							
	The facility is well designed	.862	4.11	.931	.864	4.00	.935
	The facility layout serves my purposes	.867	4.18	.878	.872	4.05	.916
	I'm impressed with facility design	.864	3.97	.989	.864	3.91	1.008
	The facility is aesthetically attractive	.873	3.90	1.034	.880	4.11	.897
	The facility is safe and comfortable	.892	4.41	.826	.902	4.32	.821
Equipment		.883			.882		
(n = 621) I							
(n = 611) P							
	The provided equipment is up-to-date	.833	4.44	.771	.823	4.17	.901
	A variety of up-to-date equipment is available	.814	4.39	.758	.830	4.18	.867
	The equipment is in good usable condition	.852	4.56	.683	.844	4.30	.824
Social Benefit		.946			.937		
(n = 542) I							
(n = 533) P							
	Sense of adventure	.944	3.44	1.193	.933	3.51	1.101
	Group cooperation skills	.935	3.28	1.237	.924	3.52	1.092
	Respect for others	.937	3.46	1.212	.928	3.58	1.083
	Communication skills	.934	3.24	1.265	.923	3.41	1.128
	Leadership skills	.933	3.19	1.303	.925	3.32	1.176
	Problem solving skills	.935	3.10	1.341	.926	3.26	1.144
	Time management skills	.943	3.33	1.242	.934	3.50	1.127
	Friendship development	.945	3.30	1.271	.931	3.53	1.103
Personal/ Physical		.883			.902		
Benefits							
(n = 545) I							
(n = 538) P	Self confidence	.869	3.81	1.075	.887	3.90	.945
	Sense of accomplishment	.861	4.07	.973	.887	4.04	.940
	Weight control	.865	4.03	1.091	.889	3.86	.975
	Physical strength	.858	4.16	.993	.885	4.03	.935
	Stress reduction	.861	4.22	.990	.883	4.09	.930
	Balance and coordination	.857	4.00	1.025	.886	3.90	.936
	Fun	.891	4.29	.873	.893	4.15	.904

Note. Questions listed in this table have been modified for fit. a (I) = Cronbach's alpha score for Importance; m (I) = mean score for Importance; sd (I) = standard deviation for Importance; a (P) = Cronbach's alpha score for Performance; m (P) = mean score for Performance; sd (P) = standard deviation for Performance.



Service Quality and Benefit Relationship

Hypothesis #1 stated that there is no statistically significant relationship between the respondent's perceived dimensions of service quality and recreational benefits. A Pearson correlation coefficient was calculated for the relationship between multiple variables important to this study. Strong correlations were not found in any of the correlations when analyzed for dimensions of service quality and perceived recreational benefits. Moderate correlations were found between all variables except six. Weak correlations were found in range of program and social benefits importance ($r = .215$, $p < .01$, $n = 539$), operating times and social benefits importance ($r = .127$, $p < .01$, $n = 532$), physical change and social benefits importance ($r = .297$, $p < .01$, $n = 534$), equipment and social benefits importance ($r = .312$, $p < .01$, $n = 539$). In addition, weak relationships were found between operating times and social benefits performance ($r = .322$, $p < .01$, $n = 525$), and equipment and social benefits performance ($r = .323$, $p < .01$, $n = 525$).

Table 5 shows the correlations between the 11 service quality factors measured for their relationship to social benefits importance and performance as well as personal/ physical benefits importance and performance.

Table 5

Service Quality Factor Correlations by Social Benefits and Personal/Physical Benefits Importance and Performance

Factor	Social Benefits Importance	Social Benefits Performance	Personal/ Physical Benefits Importance	Personal/ Physical Benefits Performance
Range of Program	.215	.385	.424	.507
Operating Times	.127	.322	.423	.379
Information	.394	.402	.470	.444
Client Employee Interaction	.389	.487	.592	.532
Inter- Client Interaction	.567	.577	.458	.540
Physical Change	.297	.435	.628	.688
Valance	.375	.518	.643	.696
Sociability	.625	.639	.421	.523
Ambient Condition	.547	.478	.567	.539
Design	.427	.418	.534	.533
Equipment	.312	.323	.520	.416

Note. Pearson's Correlation Coefficient test; all correlations are significant at the .01 level.

Institutional Differences

A One-Way Analysis of Variance (ANOVA) was computed to determine service quality and benefits factors with institutional type (liberal arts college, comprehensive university and research based university). Significant differences were found between the three institutions in multiple areas including Client-Employee Interaction Importance ($F(2,601) = 6.745$, $p < .05$); Physical Change Importance ($F(2, 589) = 5.803$, $p < .05$); Valence Importance ($F(2, 599) = 3.219$, $p < .05$); Personal/ Physical Benefits Importance ($F(2, 540) = 3.293$, $p < .05$); Range of Program Performance ($F(2, 603) = 3.602$, $p < .05$); and Client-Employee Interaction Performance ($F(2, 582) = 4.229$, $p < .05$).

A Scheffe Post Hoc Test was computed to determine the nature of the differences between the three institutions (liberal arts college, comprehensive university and research based university) related to importance.

In addition, a Scheffe Post Hoc Test was also used to determine the nature of the differences between the three institutions (liberal arts college, comprehensive university and research based university) related to performance. Table 6 shows the factors that indicated significant difference.

Table 6

One- Way ANOVA Test for Service Quality and Benefits by Institution

Factor	n	Comp m	Comp sd	Comp M	Comp sd	R1 m	R1 sd	F	df	sig
Client- Employee Interaction Importance	604	4.42	.63	4.41	.63	4.21	.69	6.74	2	.001
Physical Change Importance	592	4.10	.99	4.33	.74	4.09	.87	5.80	2	.003
Valence Importance	602	4.40	.62	4.43	.63	4.28	.72	3.21	2	.041
Personal/ Physical Benefits Importance	543	4.15	.80	4.14	.67	3.97	.86	3.29	2	.038
Range of Program Performance	606	3.65	.79	4.94	.72	3.87	.78	3.60	2	.028
Client- Employee Interaction Performance	585	3.77	.74	3.98	.74	3.80	.75	4.22	2	.015

Note. Lib = Liberal Arts College, Comp = Comprehensive University, R1= Research Based University; Scale Importance: 1 = Not at all Important; 2 = Somewhat Important; 3 = Neutral; 4 = Important; 5 = Very Important; Scale Performance: 1 = Very Low Performance; 2 = Low Performance; 3 = Neutral; 4 = High Performance; 5 = Very High Performance; m = mean score; sd = standard deviation; f = f- value; df = degrees of freedom; sig = significance level.

Program Type Differences

A One-Way ANOVA was computed to determine the difference between the dimensions of service quality and perceived recreational benefit factors with program type (intramurals, aquatics and fitness). Significant differences were found between the three program types in multiple areas including Range of Program Importance ($F(2, 615) = 11.60$, $p < .05$); Operating Time Importance ($F(2, 608) = 16.06$, $p < .05$); Information ($F(2, 605) = 6.60$, $p < .05$); Client-Employee Interaction Importance ($F(2, 601) = 9.93$, $p < .05$); Physical Change Importance ($F(2, 589) = 19.98$, $p < .05$); Valence Importance ($F(2, 599) = 11.48$, $p < .05$); Sociability Importance ($F(2, 580) = 7.93$, $p < .05$); Equipment Importance ($F(2, 586) = 4.73$, $p < .05$); Social Benefit Importance ($F(2, 537) = 4.66$, $p < .05$); Personal/ Physical Benefits Importance ($F(2, 540) = 14.31$, $p < .05$); Range of Program Performance ($F(2, 603) = 5.20$, $p < .05$); Client- Employee Interaction Performance ($F(2, 582) = 3.24$, $p < .05$); Physical Change Performance ($F(2, 585) = 12.22$, $p < .05$); Sociability Performance ($F(2, 573) = 6.45$, $p < .05$); Social Benefit Performance ($F(2, 528) = 8.32$, $p < .05$); and Personal/ Physical Benefit Performance ($F(2, 533) = 3.74$, $p < .05$).

A Scheffe Post Hoc Test was used to determine the nature of the differences between the three types of programs (intramurals, aquatics and fitness) related to importance. Also a Scheffe Post Hoc Test was used to determine the nature of the differences between the three types of programs (intramurals, aquatics and fitness) related to performance.

Table 7 shows the population, mean scores and standard deviation scores for all three program areas (intramurals, aquatics and fitness). In addition, Table 7 shows the F- value, degrees of freedom and significance level for each factor that showed a significant difference by program type (intramurals, aquatics and fitness).

Table 7

One-Way ANOVA Test for Service Quality and Benefits by Program Type

Factor	n	Intra m	Intra sd	Aqua m	Aqua sd	Fit m	Fit sd	f	df	sig
Range of Program Importance	618	3.81	.95	4.06	.79	4.18	.77	11.60	2	.000
Operating Times Importance	611	4.20	.79	4.55	.56	4.52	.59	16.06	2	.000
Information Importance	608	3.88	.88	4.23	.64	3.97	.75	6.60	2	.001
Client- Employee Interaction Performance	604	4.18	.81	4.53	.54	4.36	.59	9.93	2	.000
Physical Change Importance	592	3.90	.97	4.21	.85	4.38	.67	19.98	2	.000
Valence Importance	602	4.16	.81	4.43	.62	4.45	.58	11.48	2	.000
Social Interaction Importance	583	3.62	.93	3.16	1.09	3.24	1.16	7.93	2	.000
Equipment Importance	589	4.36	.69	4.38	.73	4.53	.61	4.73	2	.009
Social Benefits Importance	540	3.50	.99	3.26	.90	3.18	1.14	4.66	2	.010
Personal/ Physical Benefits Importance	543	3.83	.88	4.02	.72	4.23	.68	14.31	2	.000
Range of Program Performance	606	3.73	.84	3.98	.64	3.93	.72	5.20	2	.006
Client- Employee Interaction Performance	585	3.81	.81	4.05	.67	3.88	.74	3.24	2	.040
Physical Change Performance	588	3.72	.83	4.03	.87	4.09	.76	12.22	2	.000
Sociability Performance	576	3.65	.93	3.40	1.02	3.31	1.05	6.45	2	.002

Factor	n	Intra m	Intra sd	Aqua m	Aqua sd	Fit m	Fit sd	f	df	sig
Social Benefit Performance	531	3.68	.81	3.48	.83	3.31	.99	8.32	2	.000
Personal/ Physical Benefit Performance	536	3.88	.77	3.91	.76	4.07	.71	3.74	2	.024

Note. Intra = Intramurals, Aqua = Aquatics, Fit = Fitness; Scale Importance: 1 = Not at all Important; 2 = Somewhat Important; 3 = Neutral; 4 = Important; 5 = Very Important; Scale Performance: 1 = Very Low Performance; 2 = Low Performance; 3 = Neutral; 4 = High Performance; 5 = Very High Performance; m = mean score; sd = standard deviation; f = f- value; df = degrees of freedom; sig = significance level.

Gender Differences

An independent t test was performed to compare the dimensions of service quality and perceived recreational benefit differences by gender. Significant difference were found between genders in multiple areas including: (a) range of program importance; (b) operating times importance; (c) information importance; (d) client-employee interaction importance; (e) physical change importance; (f) valence importance; (g) ambient condition importance; (h) design importance; and (i) personal/physical benefits importance. In addition, gender differences were found in four performance factors including: (a) physical change performance; (b) sociability performance; (c) social benefit performance; and (d) personal/ physical benefit performance. Table 8 shows significant differences in service quality and benefits factors between genders. Table 8 also shows the factor; mean score for male and female respondents, population size, t value, degrees of freedom and significance level.

Table 8

Service Quality and Benefit Differences by Gender

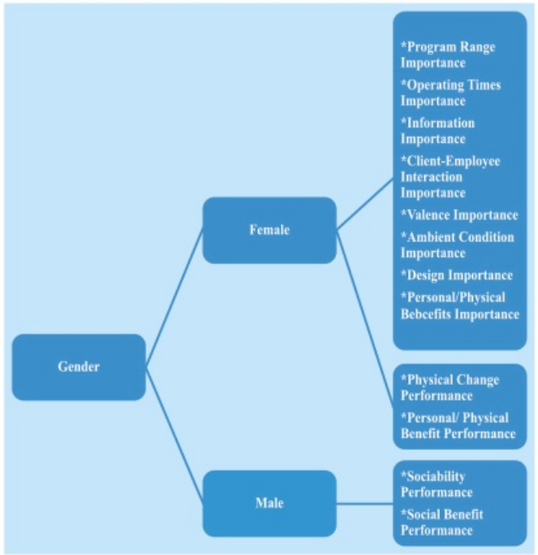
Factor		m	n	t	df	Significance Level
Range of Program Importance				-6.442	616	.000
	Male	3.76	218			
	Female	4.21	400			
Operating Times Importance				-7.816	609	.000
	Male	4.15	213			
	Female	4.58	398			
Information Importance				-3.746	606	.001
	Male	3.83	214			
	Female	4.08	394			
Client- Employee Importance				-4.630	602	.000
	Male	4.17	215			
	Female	4.43	389			
Physical Change Importance				-4.956	590	.000
	Male	3.99	205			
	Female	4.34	397			
Valence Importance				-5.041	600	.000
	Male	4.18	206			
	Female	4.46	396			
Ambient Condition Importance				-2.244	589	.032
	Male	4.03	204			
	Female	4.17	387			
Design Importance				-2.753	575	.033
	Male	3.99	198			
	Female	4.18	279			
Personal/ Physical Benefits Importance				-6.054	541	.000
	Male	3.81	191			
	Female	4.22	352			

Physical Change Performance				-2.521	586	.020
	Male	3.86	204			
	Female	4.04	384			
Sociability Performance				2.216	574	.022
	Male	3.55	201			
	Female	3.36	375			
Social Benefit Performance				2.484	529	.015
	Male	3.58	188			
	Female	3.37	343			
Personal/ Physical Benefit Performance				-2.197	534	.022
	Male	3.89	188			
	Female	4.04	348			

Note. m = mean score; n = population size; t = t- value; df = degrees of freedom; sig = significance.

Figure 2 shows which gender indicated higher means scores for the dimensions of service quality and perceived recreational benefits factors. Importance and performance factors have been separated in this figure for ease in reading.

Figure2. Service Quality and Benefit Differences by Gender



Analysis of Hypothesis Statements

Hypothesis 1

Hypothesis 1 states: "There is no statistically significant relationship between the respondent's perceived dimensions of service quality and recreational benefits. The findings indicate that all 11 service quality factors relate to the two recreational benefit factors. Six of the factors had a weak correlation with the remaining factors showing a moderate level of correlation. None of the factors showed a strong correlation above .70.

Service quality has been studied in recreational sports setting with a number of factors including: (a) behavioral intentions (Osman et al., 2006); (b) scale development (Ko & Pastore, 2007); (c) self-identification (Shonk et al., 2010); (d) encounter and citizen behavior (Chung, 2006); and (e) social identification (Soleymani et al., 2012). Recreational Benefits has also been studied in recreational sports settings a number of times using the NIRSA QIRS scale including: Bryant et al. (1995); Kovac and Beck (1997); Haines (2001); Lindsay and Sessoms (2006); and Lindsay (2012). This study indicates that there is a relationship between dimensions of services quality and perceived recreational benefits.

Hypothesis 2

Hypothesis 2 states: "There is no statistically significant difference between the respondent's institution and the impact on their perceptions of dimensions of service quality and perceived recreation benefits."

A One-Way Analysis of Variance (ANOVA) was computed to explore the difference between one's institution and the perceptions of dimension of services quality and perceived recreational benefits. Differences were found in importance of client-employee interaction, physical change, valence, and personal/physical benefits. In addition, differences were found in the performance of institutions recreational sports programs in providing range of program and client- employee interaction. This study indicates that differences do exist between types of institutions (liberal arts college, comprehensive university and research based university) in multiple service quality and benefit factors.

Hypothesis 3

Hypothesis 3 states: "There is no statistically significant difference between the respondent's perceptions of dimensions' service quality and program areas such as intramurals, aquatics and fitness."

A One-Way Analysis of Variance (ANOVA) was computed to explore the difference between types of programs and the perceptions of services quality and perceived recreational benefits. There were differences found that were found in importance of range of program, operating time, information, client-employee interaction, physical change, valence, sociability, and equipment. In addition, differences were found in the performance of the programs in range of program, client-employee interaction, physical change, and sociability. This study did survey participants from three types of programs (intramurals, aquatics and fitness) showing differences in perceptions of dimensions of service quality and type of program.

Hypothesis 4

Hypothesis 4 states: "There is no statistically significant difference between the respondents perceived recreational benefits and program areas such as intramurals, aquatics and fitness."

A One-Way Analysis of Variance (ANOVA) was computed to explore the difference between types of programs (intramurals, aquatics and fitness) and perceived recreational benefits. There were differences found in the importance of social benefits, and personal/ physical benefits and type of program (intramurals, aquatics and fitness). In addition, differences were found in the performance of the programs in social benefit, and personal/ physical benefit. To date, few if any studies have explored perceptions of services quality and perceived recreational sports as they related to individual programs (intramurals, aquatics and fitness). This study did survey participants from three types of programs (intramurals, aquatics and fitness) showing differences in perceived recreational benefits and type of program.

Hypothesis 5

Hypothesis 5 states: "There is no statistically significant relationship between the respondent's perceptions regarding dimensions of service quality and one's position within their institution (participant type), national origin, gender and ethnicity."

A One-Way Analysis of Variance (ANOVA) was computed to explore the difference between participant types (students, faculty/ staff, alumni and community) and dimensions of service quality. Differences were found in multiple importance factors including: (a) operating times; (b) information; (c) inter-client interaction; and (d) social benefits. In addition, differences were found in multiple performance factors including: (a) physical change; (b) ambient condition; (c) equipment; and (d) social benefits. A review of mean scores indicated that faculty/ staff rated the importance and performance of these factors lower than other participant groups.

A low response to the national origin variable dictated eliminating it from consideration. Many service quality studies have indicated differences in perception of services quality in recreational settings among citizens of different countries including South Korea, Turkey, Greece, Canada, the United States and Iran. A t test was used to determine the relationship between dimensions of service quality and gender. Females rated the following service quality factors more important than males: (a) range of program; (b) operating times; (c) information; (d) client-employee interaction; (e) valence; (f) ambient condition; and (g) design. Females also rated the performance of the recreational sports programs higher than males in physical change performance.

At test was used to determine the relationship between dimensions of service quality and ethnicity. No relationship was found between dimensions of service quality and ethnicity. Previous studies (Ko & Pastore, 2007; Shonk et al., 2010) did include an ethnicity question in their studies, however they did not indicate any significance in dimensions of service quality and ethnicity.

Hypothesis 6

Hypothesis 6 states that "there is no statistically significant relationship between the respondent's perceived recreational benefits and one's position within their institution (participant type), national origin, gender and ethnicity."

A One-Way Analysis of Variance (ANOVA) was computed to explore the difference between participant types (students, faculty/ staff, alumni and community) and perceived recreational benefits. Students reported that Social Benefits are more important than alumni followed by community then faculty/ staff. Social Benefits performance was rated highest by alumni followed by students then community and faculty/staff. A low response to the national origin variable dictated eliminating it from consideration. To date, no studies were found indicating differences in perceived recreational benefits among national origin in recreational sports settings.

At test was used to determine the relationship between perceived recreational benefits and gender. Females rated personal/ physical change benefit more important than males. Females also reported higher performance of the recreational sports programs in personal/ physical benefit than males. Males reported high performance of the recreational sports programs in social benefit performance. Previously mentioned studies (Kovac & Beck, 1997; Haines, 2001; Lindsay & Sessoms, 2006) all reported differences in perceived recreational benefits by gender while using the NIRSA QIRS instrument.

At test was used to determine the relationship between perceived recreational benefits and ethnicity. No relationship was found between perceived recreational benefits and ethnicity. Previous studies (Bryant et al., 1995; Kovac & Beck, 1997; Haines, 2001; Lindsay & Sessoms, 2006) all found significance differences in perceived recreational benefits and ethnicity.

A chi-square test was computed to examine the association of recruitment and retention with year in school, type of program and ethnicity. No significant association was found between recruitment or retention with year in school, type of program or ethnicity.

CONCLUSION

Analysis of the data confirmed correlations from between dimensions of service quality and perceived recreational benefits. In addition, significant differences were found when analyzing type of institution (Liberal Arts College, comprehensive university and research based university), program type (intramurals, aquatics and fitness), participant type (students, faculty/ staff, alumni and community) and gender. No significant differences were found when analyzing dimensions of service quality and perceived recreational benefits with ethnicity.

Lastly, no significant association was found in participant type, program type or ethnicity with recruitment or retention.

Although this study had a low response rate and a homogeneous population, valuable information has been obtained in this study which should add to the body of knowledge in recreational sports. Generalizability of the results of this study in all recreational sports programs is not advised due the previously mentioned issues.

Recreational sports program administrators should continue to re-evaluate their programs and make necessary changes as programs and services evolve and technology improves. An example of this importance lies in gender specific programming. Recreational sports administrators may want to re-evaluate expenditures in gender programming based on male and female student enrollment. Females in this study indicated higher importance in eight services quality factors then males. The larger differences were found in operating times and client-employee interaction indicating that recreational sports administrators should consider spending more time in customer services training with staff. This also indicates that recreational sports administrators should investigate operating times of facilities and programs. This investigation would need to be institution specific as not all program times fit all populations.

As shown in this study, program administrators may also what to re-evaluate expenditures in types of programs. Intramural participants indicated less importance in multiple service quality and benefit factors.

Although social benefit importance and performance factors did correlate with all 11 service quality factors, they were more weakly correlated then personal/ physical benefit importance and performance. In addition, the factors related to social interaction had low to mid-range mean scores indicating that participants find social reasons for participating less important to other factors. Recreational sports administrators may want to reconsider the amount of space that is allocated for social interaction during renovations and new builds. In addition, recreational sports program administrators need to consider budget allocations in the areas of social programming.

In conclusion, this study as well as others have shown the need for future inquiry. The field of recreational sports is evolving daily with recreational sports administrators not only following trends but creating them as well. The college and university atmosphere usually allows for innovation in the recreational sports field and participants demand up-to-date programming and equipment. Understanding the needs and wants of participants is the most effective way to meet their wants and needs and this study clearly links those wants and needs with how program administrators implement service quality measures. RMA

References

Bartlett, P., & Einert, A. E. (1992). Analysis of the design function of an adult softball complex in a new public recreational park. Journal of Park and Recreation Administration, 10(1), 71-81.

Bryant, J. A., Banta, T. W., & Bradley, J. L. (1995). Assessment provides insight into the impact and effectiveness of campus recreation programs. NASPA Journal, 32, 153- 160.

Canadian Information Centre for International Credentials (n.d.). Postsecondary education systems in Canada: An overview. Retrieved March 30, 2013, from http://www.cicic.ca/421/an-overview.canada

Chung, T. W. (2006). The moderating effects of involvement on the relationship among perceived service quality, customer satisfaction, and customer citizenship behavior. (Doctoral Dissertation). Available from ProQuest Dissertations and Theses database. (UNI No. 3252106)

Crompton, J. L., & Duray, N. A. (1985). An investigation of the relative efficacy of four alternative approaches to importance- performance analysis. Academy of Marketing Science, 13(4), 69-80.

Crompton, J. L., & MacKay, K. J. (1989). Users' perceptions of relative importance of service quality dimensions in selected public recreation programs. Leisure Sciences, 11(4), 367-375.

Crompton, J. L., MacKay, K. J. & Fesenmaier, D. R. (1991). Identifying dimensions of service quality in public recreation. Journal of Park and Recreation Administration, 9(3), 15-26.

Cronk, B. C. (2012). How to use SPSS: A step-by-step guide to analysis and interpretation (7th ed). Glendale, CA: Pyrczak Publishing

Edginton, C. R., Hudson, S. D., Dieser, R. B., & Edginton, S. R. (2004). Leisure programming: A service- centered and benefits approach (4th ed). Dubuque, IA: McGraw-Hill.

Fried, G. (2010). Managing sport facilities. Champaign, IL: Human Kinetics.

Guadagnolo, F. (1985). The Importance-Performance Analysis: An Evaluation and Marketing Tool. Journal of Park and Recreation Administration, 3(2), 13-22.

Havitz, M. E., Twynam, G. D. & DeLorenzo, J. M. (1991). Important-performance analysis as a staff evaluation tool. Journal of Park and Recreation Administration, 9(1), 43-54.

Haines, D. J. (2001). Undergraduate student benefits from university recreation. NIRSA Journal, 25(1), 25-33.

Hollenhorst, S. J., Olson, D. & Fortney, R. (1992). Use of importance-performance analysis to evaluate state park cabins: the case of the West Virginia state park system. Journal of Park and Recreation Administration, 10(1), 1-11.

Ipson, N., Rehman, L., & Stegen, D. (2010). Public relations, marketing and customer service. In M. Moiseichik (Ed.). Management of parks and recreation agencies (pp. 349-389). Ashburn, VA: National Recreation and Park Association.

Kim, D., & Kim, S. Y. (1995). QUESC: An instrument for assessing the service quality of sport centers in Korea. Journal of Sports Management, 9, 208-220.

Ko, Y. J., & Pastore, D. L. (2007). An instrument to assess customer perceptions of service quality and satisfaction in campus recreation programs. Recreational Sports Journal, 31(1), 34-42.

Kovac, D. C., & Beck, J. E. (1997). A comparison of student perceptions, satisfaction and patterns of participation in recreational sports. NIRSA Journal, 22(1), 10-12.

Lindsay, R. R. (2012). The benefits and satisfaction of participating in campus recreational sports facilities and programs among male and female African American students: A pilot study. Recreational Sports Journal, 36(1), 12-24.

Lindsey, R. R. & Sessoms, E. (2006). Assessment of a campus recreation program on student recruitment, retention, and frequency of participation across certain demographic variables. Recreational Sports Journal, 30(1), 30-39.

Martilla, J. A., & James, J. C. (1977). Importance- performance analysis. Journal of Marketing, 41(1), 77-79.

Mawson, L. M. (1993). Total quality management: Perspectives for sport managers. Journal of Sport Management, 7, 101-106.

Miller, R. D. (2000). Customer service for the new millennium. NIRSA Journal, 24(1), 60-66.

Mueller, P. & Mitchell, E. (1960). Intramural Sports (3rd ed.). New York, NY: The Ronald Press Company.

Mueller, P. & Reznik, J. W. (1979). Intramural-recreational sports: Programming and administration (5th ed.). New York, NY: John Wiley & Sons.

Novatorov, E. V. (1997). An importance- performance approach to evaluating internal marketing in a recreation centre. Managing Leisure, 2, 1-16.

Oh, H. (1999). Service quality, customer satisfaction, and customer value; A holistic perspective. Hospitality Management, 18, 67-82.

Oh, H. (2001). Revisiting importance- performance analysis. Tourism Management, 22, 617-627.

Osman, R. W., Cole, S. T., & Vessell, C. R. (2006). Examining the role of perceived service quality in predicting user satisfaction and behavioral intentions in a campus recreation setting. Recreational Sports Journal, 30(1), p. 20-29.

Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1985). A conceptual model of service quality and its implication. Journal of Marketing, 49, 41-50.

Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1988). SERVQUAL: A multi-item scale for measuring consumer perceptions of service quality. Journal of Retailing, 64(1), 12-40.

Richardson, S. L. (1987). An importance- performance approach to evaluating communication effectiveness. Journal of Parks and Recreation, 5(4), 71-83.

Shonk, D. J., Carr, J. W., & DeMichelle, P. E. (2010). Service quality and satisfaction within campus recreation: The moderating role of identification. Recreational Sports Journal, 34(1), 9-23.

Soleymani, M., Zarei, A., Tojari, F., & Ghafouri, F. (2012) A study of the relationship between the quality of services and customers' satisfaction with recreational sports programs with regards to the moderating role of identity. World Applied Sciences Journal, 16(10), 1438-1444.

Urdan, T. C. (2010). Statistics in plain English (3rd ed). New York, NY: Routledge.

Williams, A. E. & Neal, L. L. (1993). Motivational assessment in organizations: an application of importance-performance analysis. Journal of Park and Recreation Administration, 11(2) 60-71.

Young, S. J., Ross, C., & Barcelona, R. J. (2003). Perceived constraints by college students to participation in campus recreational sports programs. Recreational Sports Journal, 27(2), 47-62.

Motivational Analysis of Golf Participation in Hong Kong

Sandra Mak Sin Yu

Department of Sports and Physical Education

Hong Kong Baptist University

Background

Hong Kong Government policy in sport development is to (1) promote sport in the community, (2) support elite sports and (3) develop Hong Kong into a major international sports event hub (Sports Commission, 2018). Together with the report from Centre for Health Protection, Department of Health (2017), the life expectancy of Hong Kong's males and females are 81.9 years and 87.6 years respectively. It is a significant increase compared with the life expectancy in 1971 (67.8 years for males and 75.3 years for females). With longer life expectancy, people begin to concern more about their quality of life. World Health Organization (2010) has raised physical inactivity as the fourth leading mortality for global population. Obviously, it is imperative to investigate how to motivate people to participate in more physical activities for a healthier and happier life.

With the excitement of golf returning to Olympic sport since 1904, it has brought significant attention on golf development and participation all around the world. With the 7.4 million populations in Hong Kong and as a high density city, limited space and venue are the major constraints for Hong Kong citizens to play Golf as their regular sport activity (Census and Statistics Department, 2017). It is speculated that a local golfer competed in 2016 Summer Olympic Games might bring significant attention from worldwide and especially inspired many local kids as well as causal golfers coming back to the golf family.

Golf is a sport suitable for all ages and can enhance their health including cardiovascular, respiratory, muscular endurance/strength, and individual's mental health (Luscombe et al., 2017, Murray et al., 2016). It may also extend 5-year life expectancy when compare golfer and non-golfer (Hawkes, Malik & Murray, 2016). Golf has no age limitation, nurtures self-discipline, produces the perception of mastery experience, values honesty among players, and encourages player to enjoy nature (ref). With these benefits, golf is a good choice to promote life sport participation among Hong Kong people.

There is limited motivational research to investigate golfer's motivation in Hong Kong. The purpose of the present study was to investigate Hong Kong golfer's participation motivation. Physical Activity and Leisure Motivation Scale (PALMS) (Rogerset al., 2008) was used to evaluate why the Hong Kong amateur golfers would like to play golf and group differences would be investigated including golfers' demographic characteristics such as gender, age and their USGA handicap index & frequency of playing golf. The findings of this study not only provide a preliminary picture to raise the focus on how to motivate golfers in Hong Kong but also address the opportunity of marketing implantation.

Research questions:

Q1: Are golfers motivated by golf unique motivation factors more than the motives factors in PALMS?

Q2: Which is the major factor motivates golfers among PALMS?

Q3: Are there any motivator differences between gender, age group, playing ability and frequency of playing golf in golf participation in Hong Kong?

Method:

Participants and data collection

232 amateur golfers (91 females and 141 males) were recruited in the study. Questionnaires were sent to Hong Kong Golf Association and the Association circulated to their squad members who are currently playing golf in Hong Kong. Local golfer network was also contacted to recruit participants through email and WhatsApp. The researcher provided the study information to all participants and explained the purpose of the study before they agreed to complete the online questionnaire. Ethical approval of the study is completed under the Research Ethics Committee, Hong Kong Baptist University.

Questionnaire

The questionnaires were divided into two sections. The first part is participant's gender, age, USGA handicap index, living distance to golf course, the frequency of playing a round of 18 holes in Hong Kong each month and golfing experience. The second part is their motivational factors to play golf. The motivational factors were measured in a five-point Likert scale to reflect participant's motivation (5 = strongly agree, 1 = strongly disagree). There are nine dimensions of motives defined in the questionnaire: affiliation, appearance, competition/ego, enjoyment, mastery, other expectations, physical condition, psychological condition, and the golf unique factor. The Cronbach's Alpha of PALMS and golf unique factor are from 0.61 to 0.87.

Data Analysis

Statistical Package for the Social Science (SPSS) software program 24.0 was employed to analyze the data in this research. The data consisted of participants' demographic information and the motivation factors of PALMS. Descriptive statistics (i.e. mean, standard deviation) was reported. Cronbach's Alpha was done for the reliability of the five items of each motivation factors between PALMS and golf unique motives. Pearson product-moment correlation coefficient is conducted to examine the relationship between the nine dimensions of the motives. T-test and one-way ANOVA were used to examine the differences between motivations and the participants' gender, age, handicap index, living distance to golf course, frequency of playing a round of 18 holes each month and their golfing experience.

Results

Descriptive Statistics

The descriptive statistics in Table 1 with 232 participants (91 females and 141 males) and their age is from 19 to 64 years old. 80.6% of them are USGA Handicap holders and the majority of handicap holders were between 10 to 19. 9 handicap index. 71.6 % of the participants have 7 years or more golfing experience. Majority of them played 1-2 times 18-hole golf per month on average. They were mostly allocated as scratch golfers and/or 3 years or above of golfing experience. It showed that the participants committed to participate in golf as their regular physical activity in their life.

Means & Standard Deviation

Table 2 showed the highest mean of nine motivation factors was "golf unique" (M=4.24, SD=0.66) while the mean value of the enjoyment factors (M= 4.21, SD=0.63) was the highest mean among eight factors in PALMS. In 45 items, the top three highest mean items score were "enjoyed natural environment" (M=4.53, SD=0.76), "no age limitation" (M=4.38, SD=0.90) and "self-discipline game" (M=4.43, SD=0.81) which correlated with golf unique motivation factors. Among the PALMS, enjoyment factors – "because it's fun" (M=4.38, SD=0.76), "because it makes me happy" (M=4.32, SD=0.79) and "because it's interesting" (M=4.31, SD=0.83) were the three highest mean score items. The lowest three mean score of items were under other expectation factors: "because I get paid to do it" (M=1.50, SD=0.97) , "because it was prescribed by the doctor, physio" (M=1.77, SD=1.06).

Table 1. Descriptive Statistics

Background	Demographics		Frequencycs	Percentage (%)
Gender	Female		91	39.2
	Male		141	60.8
		Total	**232**	**100.0**
Age range	12 years or below		24	10.3
	13 years to 18 years		34	14.7
	19 years to 64 years		158	68.1
	65 years of abov		16	6.9
Marital status	Single	**Total**	**232**	**100.0**
	Married		96	41.4
	Family		80	34.5
			56	24.1
		Total	**232**	**100.0**
How far do you	Less than 15 mins		25	10.8
Inter- client interaction	15 to 30 mins drive		55	23.7
live from any golf	31 to-44 mins drive		92	39.7
course in Hong Kong?	45 mins or above		60	25.9
		Total	**232**	**100.0**
Do you have	Yes		187	80.6
USGA Handicap	No		45	19.4
Index?		**Total**	**232**	**100.0**
Handicap Index	plus handicap (scratch golfer)		89	38.4
	Single handicap (0 to 9.9)		48	20.7
	10-19.9		28	12.1
	20-29.9		19	8.2
	30-36.4 (Male) or 30-40.4(Female)		13	5.6
	No USGA Handicap		35	15.1
		Total	**232**	**100.0**
Years of Golf	1 year or below		7	3
Experience	1 to 2 years		13	5.6
	3 to 6 years		46	19.8
	7 years or above		166	71.6
		Total	**232**	**100.0**
How often do you	1 – 2 times		89	38.4
play a round of 18	3 – 4 times		48	20.7
holes in Hong Kong	5 – 6 times 28 12.1		28	12.1
per month in average?	7 – 8 times		19	8.2
(Re: 9 holes +9	9 times of above		13	5.6
holes =18 holes)	None		35	15.1
		Total	**232**	**100.0**

Table 2. Reliability tests on Cronbach's Alpha

Motivation Factors (N=165)	Cronbach's Alpha	Mean	Standard Deviation
Golf Unique (Item=5)	**0.82**	**4.24**	**.66**
No age limitation (41)		4.38	0.90
Play as individual game (42)		4.10	0.94
Self-Discipline Game(43)		4.43	0.81
Decrease of Relinquish (44)		3.76	0.96
Enjoy natural environment (45)		4.53	0.76
Enjoyment (Item=5)	**0.83**	**4.21**	**0.63**
Because it's interesting (3)		4.31	0.83
Because it makes me happy (13)		4.32	0.79
Because it's fun (25)		4.38	0.76
Because I enjoy exercising (34)		3.93	0.89
Because I have a good time (37)		4.13	0.93
Mastery (Item=5)	**0.80**	**3.97**	**0.70**
To get better at an activity (5)		4.15	0.92
To improve existing skills (16)		4.09	0.93
To do my personal best (19)		4.16	0.91
To obtain new skills/activities (24)		3.64	0.97
To keep current skill level (31)		3.80	0.98
Affiliation (Item=5)	**0.87**	**3.95**	**0.72**
Because I enjoy spending time with others		4.08	0.86
To do activity with others (8)		3.92	0.84
To do something in common with friends		3.92	0.96
To talk with friends exercising (30)		3.78	0.95
To be with friends (38)		4.06	0.83

Psychological Condition (Item=5)	**0.87**	**3.78**	**0.77**
Because it helps me relax(2)		3.92	0.96
To better cope with stress (9)		3.53	0.93
To get away from pressures (14)		3.95	0.93
Because it acts as a stress release (22)		3.58	1.01
To take mind off other things (35)		3.92	0.92
Physical Condition (Item=5)	**0.87**	**3.64**	**0.74**
Because it helps maintain a healthy body		3.94	0.92
Be physically fit (12)		3.44	0.92
To maintain physical health (15)		3.89	0.86
Because it keeps me healthy (28)		3.69	0.93
To improve cardiovascular fitness (33)		3.24	0.94
Competition/Ego (Item=5)	**0.75**	**3.16**	**0.77**
Because I perform better than others (6)		2.95	1.00
To be best in the group (17)		3.47	1.14
To work harder than others (27)		2.88	1.22
To compete with others around me (29)		3.50	1.09
To be fitter than others (39)		3.01	0.98
Appearance (Item=5)	**0.86**	**2.93**	**0.77**
To define muscle, look better (11)		2.73	0.96
To improve body shape (23)		3.07	0.94
To improve appearance (32)		3.08	0.93
To lose weight, look better (36)		2.80	0.97
To maintain trim, toned body (40)		3.97	1.00
Other Expectations (Item=5)	**0.61**	**2.01**	**0.68**
To earn a living (1)		1.88	1.23
Because I get paid to do it (7)		1.50	0.97
To manage medical condition (18)		2.87	1.06
Because people tell me I need to(21)		2.01	1.12
Because it was prescribed by doctor, physio (26)		1.77	1.06

Correlation

Table 3 listed significant correlations between enjoyment and psychological condition motivation (r = 0.62, p < 0.01), and physical condition and appearance motivation (r = 0.67, p < 0.01). Moreover, stronger relationships were shown between enjoyment and golf unique motivation (r = 0.58, p < 0.01), enjoyment and mastery motivation (r = 0.58, p < 0.01), mastery and competition/ego motivation (r = 0.55, p < 0.01), enjoyment and physical condition motivation (r = 0. 54, p < 0.01), physical condition and psychology condition motivation (r = 0.51, p < 0.01), enjoyment and affiliation motivation (r = 0.50, p < 0.01), golf unique and psychology condition motivation (r = 0.47, p < 0.01), golf unique and mastery motivation (r = 0.46, p < 0.01), golf unique and physical condition motivation (r = 0.44, p < 0.01), golf unique and affiliation motivation (r = 0.43, p < 0.01) and psychological condition and affiliation motivation (r = 0.41, p < 0.01).

Table 3. Correlation among motivations

subscale	OTH	PSY	ENJ	AFF	GOL	MAS	APP	PHY	COM
OTH	-	.031	-.173**	.004	-.059	.072	.305**	.111	.336**
PSY		-	.622**	.408**	.470**	.356**	.291**	.512**	.098
ENJ			-	.495**	.577**	.582**	.210**	.539**	.231**
AFF				-	.426**	.266**	.253**	.331**	.152*
GOL					-	.464**	.253**	.444**	.293**
MAS						-	.224**	.326**	.546**
APP							-	.665**	.390**
PHY								-	.193**
COM									-

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Affiliation - AFF

Appearance - APP

Competition/Ego - COM

Enjoyment - ENJ

Golf Unique - GOL

Mastery - MAS

Other Expectations - OTH

Physical Condition -PHY

0Psychological Condition -PSY

Group Comparisons

T-test (Table 4) indicated that no statistically significant difference between nine motivation factors. One-way ANOVA demonstrated that there was statistically significant differences in the groups between other expectations motivation [F(3,228) =5.12, p=0.002], mastery motivation [F(3,228) =7.10, p =0.00], appearance [F(3,228) =3.99, p =0.08] and competition/ego motivation [F(3,228) =7.50, p =0.00].

Table 4. T-tests comparison of motivation factors between gender

	Gender							
	Male		Female					
Motivation Factors	M	SD	M	SD	F	Sig	df	t
Affiliation	3.94	0.76	3.97	0.66	2.55	.78	230	.27
Appearance	2.86	0.76	3.04	0.77	.16	.07	230	1.84
Competition/Ego	3.14	0.75	3.20	0.79	.21	.53	230	.63
Enjoyment	4.27	0.66	4.12	0.58	.17	.07	230	-1.83
Golf Unique	4.21	0.67	4.28	0.66	.068	.44	230	.78
Mastery	3.91	0.74	4.06	0.62	1.58	.09	230	1.69
Other Expectations	1.96	0.65	2.08	0.72	.37	.17	230	1.38
Physical Condition	3.65	0.79	3.62	0.67	.34	.78	230	-2.83
Psychological Condition	3.83	0.82	3.71	0.68	1.46	.26	230	-1.14

Table 5 indicated the Tukey HSB test in post-hoc comparisons about difference of mean score of other expectation motivation between age 12 years or below (M=2.36, SD=0.61) and 19 to 64 years (M=1.93, SD=0.71); and 65 years or above(M=2.41, SD=0.66) and 19 to 64 years (M=1.93, SD=0.71);

Table 5. Tukey HSD Test Comparing the differences in mean motivations score of age group

Multiple Comparisons (Age Group)							
Tukey HSD							
						95% Confidence Interval	
Dependent Variable	(I) Age range	(J) Age range	Mean Diff (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
OTH	12 years	13 to 18 years	0.43	0.18	0.08	-0.03	0.89
	or below	19 to 64 years	.42922*	0.15	0.02	0.05	0.81
		65 years or above	-0.05	0.21	0.99	-0.61	0.50
	13 years	12 or below	-0.43	0.18	0.08	-0.89	0.03
	to 18	19 to 64 years	0.00	0.13	1.00	-0.32	0.32
	years	65 years or above	-0.48	0.20	0.08	-1.00	0.04
	19 years	12 years or below	-.42922*	0.15	0.02	-0.81	-0.05
	to 64	13 to 18 years	0.00	0.13	1.00	-0.32	0.32
	years	65 years or above	-.48339*	0.17	0.03	-0.93	-0.03
	65 years	12 years or below	0.05	0.21	0.99	-0.50	0.16
	or above	13 to 18 years	0.48	0.20	0.08	-0.04	1.00
		19 to 64 years	.48339*	0.17	0.03	0.03	0.93
PSY	12 years	13 to 18 years	0.28	0.20	0.54	-0.25	0.80
	or below	19 to 64 years	-0.08	0.17	0.97	-0.51	0.36
		65 years or above	0.09	0.25	0.99	-0.55	0.73
	13 years	12 or below	-0.28	0.20	0.54	-0.80	0.25
	to 18	19 to 64 years	-0.35	0.15	0.07	-0.73	0.02
	years	65 years or above	-0.19	0.23	0.85	-0.79	0.41
	19 years	12 years or below	0.08	0.17	0.97	-0.36	0.51
	to 64	13 to 18 years	0.35	0.15	0.07	-0.02	0.73
	years	65 years or above	0.17	0.20	0.84	-0.36	0.69
	65 years	12 years or below	-0.09	0.15	0.99	-0.73	0.55
	or above	13 to 18 years	0.19	0.23	0.85	-0.41	0.79
		19 to 64 years	-0.17	0.20	0.84	-0.69	0.36
ENJ	12 years	13 to 18 years	0.07	0.17	0.97	-0.36	0.51
	or below	19 to 64 years	0.09	0.14	0.92	-0.27	0.45
		65 years or above	0.12	0.21	0.94	-0.41	0.65
	13 years	12 or below	-0.07	0.17	0.97	-0.51	0.36
	to 18	19 to 64 years	0.01	0.12	1.00	-0.30	0.33
	years	65 years or above	0.04	0.19	1.00	-0.46	0.54
	19 years	12 years or below	-0.09	0.14	0.92	-0.45	0.27
	to 64	13 to 18 years	-0.01	0.12	1.00	-0.33	0.30
	years	65 years or above	0.03	0.17	1.00	-0.40	0.46
	65 years	12 years or below	-0.12	0.21	0.94	-0.65	0.41
	or above	13 to 18 years	-0.04	0.19	1.00	-0.54	0.46
		19 to 64 years	-0.03	0.17	1.00	-0.46	0.40
AFF	12 years	13 to 18 years	0.42	0.19	0.12	-0.07	0.91
	or below	19 to 64 years	0.34	0.16	0.13	-0.06	0.75
		65 years or above	0.06	0.23	0.99	-0.53	0.66
	13 years	12 or below	-0.42	0.19	0.12	-0.91	0.07
	to 18	19 to 64 years	-0.08	0.14	0.94	-0.43	0.27
	years	65 years or above	-0.36	0.22	0.35	-0.92	0.20
	19 years	12 years or below	-0.34	0.16	0.13	-0.75	0.06
	to 64	13 to 18 years	0.08	0.14	0.94	-0.27	0.43
	years	65 years or above	-0.28	0.19	0.44	-0.76	0.21
	65 years	12 years or below	-0.06	0.23	0.99	-0.66	0.53
	or above	13 to 18 years	0.36	0.22	0.35	-0.20	0.92
		19 to 64 years	0.28	0.19	0.44	-0.21	0.76
GOL	12 years	13 to 18 years	0.21	0.18	0.64	-0.25	0.67
	or below	19 to 64 years	0.19	0.15	0.57	-0.19	0.56
		65 years or above	-0.08	0.21	0.98	-0.64	0.47
	13 years	12 or below	-0.21	0.18	0.64	-0.67	0.25
	to 18	19 to 64 years	-0.02	0.13	1.00	-0.35	0.30
	years	65 years or above	-0.29	0.20	0.47	-0.81	0.23
	19 years	12 years or below	-0.19	0.15	0.57	-0.56	0.19
	to 64	13 to 18 years	0.02	0.13	1.00	-0.30	0.35
	years	65 years or above	-0.27	0.17	0.41	-0.72	0.18
	65 years	12 years or below	0.08	0.21	0.98	-0.47	0.64
	or above	13 to 18 years	0.29	0.20	0.47	-0.23	0.81
		19 to 64 years	0.27	0.17	0.41	-0.18	0.72
MAS	12 years	13 to 18 years	-0.02	0.18	1.00	-0.48	0.45
	or below	19 to 64 years	.44631*	0.15	0.02	0.06	0.83
		65 years or above	.57083*	0.22	0.05	0.01	1.13
	13 years	12 or below	0.02	0.18	1.00	-0.45	0.48
	to 18	19 to 64 years	.46150*	0.13	0.00	0.13	0.79
	years	65 years or above	.58603*	0.20	0.02	0.06	1.12
	19 years	12 years or below	-.44631*	0.15	0.02	-0.83	-0.06
	to 64	13 to 18 years	-.46150*	0.13	0.00	-0.79	-0.13
	years	65 years or above	0.12	0.18	0.90	-0.33	0.58
	65 years	12 years or below	-.57083*	0.22	0.05	-1.13	-0.01
	or above	13 to 18 years	-.58603*	0.20	0.02	-1.12	-0.06
		19 to 64 years	-0.12	0.18	0.90	-0.58	0.33
APP	12 years	13 to 18 years	0.37	0.20	0.25	-0.15	0.89
	or below	19 to 64 years	.49209*	0.16	0.02	0.07	0.92
		65 years or above	0.09	0.24	0.98	-0.54	0.72
	13 years	12 or below	-0.37	0.20	0.25	-0.89	0.15
	to 18	19 to 64 years	0.12	0.14	0.83	-0.25	0.49
	years	65 years or above	-0.28	0.23	0.60	-0.87	0.31
	19 years	12 years or below	-.49209*	0.16	0.02	-0.92	-0.07
	to 64	13 to 18 years	-0.12	0.14	0.83	-0.49	0.25
	years	65 years or above	-0.40	0.20	0.17	-0.91	0.11
	65 years	12 years or below	-0.09	0.24	0.98	-0.72	0.54
	or above	13 to 18 years	0.28	0.23	0.60	-0.31	0.87
		19 to 64 years	0.40	0.20	0.17	-0.11	0.91
PHY	12 years	13 to 18 years	0.40	0.20	0.17	-0.11	0.91
	or below	19 to 64 years	0.30	0.16	0.24	-0.11	0.72
		65 years or above	0.01	0.24	1.00	-0.61	0.62
	13 years	12 or below	-0.40	0.20	0.17	-0.91	0.11
	to 18	19 to 64 years	-0.10	0.14	0.90	-0.46	0.26
	years	65 years or above	-0.39	0.22	0.29	-0.97	0.18
	19 years	12 years or below	-0.30	0.16	0.24	-0.72	0.11
	to 64	13 to 18 years	0.10	0.14	0.90	-0.26	0.46
	years	65 years or above	-0.30	0.19	0.42	-0.80	0.20
	65 years	12 years or below	-0.01	0.24	1.00	-0.62	0.61
	or above	13 to 18 years	0.39	0.22	0.29	-0.18	0.97
		19 to 64 years	0.30	0.19	0.42	-0.20	0.80
COM	12 years	13 to 18 years	0.03	0.20	1.00	-0.47	0.54
	or below	19 to 64 years	.55601*	0.16	0.00	0.14	0.97
		65 years or above	0.41	0.24	0.31	-0.20	1.03
	13 years	12 or below	-0.03	0.20	1.00	-0.54	0.47
	to 18	19 to 64 years	.52219*	0.14	0.00	0.16	0.88
	years	65 years or above	0.38	0.22	0.33	-0.20	0.96
	19 years	12 years or below	-.55601*	0.16	0.00	-0.97	-0.14
	to 64	13 to 18 years	-.52219*	0.14	0.00	-0.88	-0.16
	years	65 years or above	-0.14	0.19	0.88	-0.64	0.36
	65 years	12 years or below	-0.41	0.24	0.31	-1.03	0.20
	or above	13 to 18 years	-0.38	0.22	0.33	-0.96	0.20
		19 to 64 years	0.14	0.19	0.88	-0.36	0.64

*. The mean difference is significant at the 0.05 level.

Affiliation – AFF

Appearance - APP

Competition/Ego - COM

Enjoyment - ENJ

Golf Unique - GOL

Mastery - MAS

Other Expectations - OTH

Physical Condition -PHY

Psychological Condition -PSY

There was a statistically significant differences between mastery motivation [F(25,226)=1.78, p=0.00] and competitio/ ego motivation [F(5,226) =4.93, p =0.00] in Table 6 in One-way ANOVA between motivations and handicap level .

Table 6. One-way ANOVA Between Motivations and handicap level

			Sum of Squares	df	Mean Square	F	Sig
OTH	Between Groups		4.52	5	0.91	1.99	0.08
	Within Groups		102.59	226	0.45		
		Total	107.11	231			
PSY	Between Groups		3.12	5	0.62	1.05	0.39
	Within Groups		134.85	226	0.60		
		Total	137.96	231			
ENJ	Between Groups		1.53	5	0.31	0.76	0.58
	Within Groups		90.87	226	0.40		
		Total	92.40	231			
AEF	Between Groups		1.17	5	0.23	0.44	0.82
	Within Groups		118.95	226	0.53		
		Total	120.12	231			
GOL	Between Groups		1.15	5	0.23	0.52	0.77
	Within Groups		100.94	226	0.45		
		Total	102.09	231			
MAS	Between Groups		8.90	5	1.78	3.84	0.00
	Within Groups		104.70	226	0.46		
		Total	113.59	231			
APP	Between Groups		1.56	5	0.31	0.53	0.76
	Within Groups		134.00	226	0.59		
		Total	135.56	231			
PHY	Between Groups		1.14	5	0.23	0.41	0.84
	Within Groups		126.23	226	0.56		
		Total	127.36	231			
COM	Between Groups		13.37	5	2.67	4.93	0.00
	Within Groups		122.59	226	0.54		
		Total	135.96	231			

Affiliation – AFF
Appearance - APP
Competition/Ego - COM
Enjoyment - ENJ
Golf Unique - GOL
Mastery - MAS
Other Expectations - OTH
Physical Condition –PHY
Psychological Condition -PSY

There was a statistically significant between enjoyment motivation [F (5,226) =2.49, p =0.03], mastery motivation [F (5,226) =4.18, p =0.00], and competition/ego motivation [F (5,226) =3.78, p =0.00] in Table 7 and 8.

Table 7. Descriptives different motivations and frequency of playing golf

Motivation		N	Meam	Std. Deviation	Std. Error	95% Confidence Interval for Mean Lower Bound	Upper Bound
OTH	1-2 times	89	2.11	0.77	0.08	1.95	2.27
	3-4 times	48	1.95	0.66	0.09	1.76	214
	5-6 times	28	1.83	0.52	0.10	1.63	2.03
	7-8 times	19	2.08	0.65	0.15	1.77	2.40
	9 times or above	13	2.05	0.57	0.16	1.70	2.39
	None	35	1.90	0.63	0.11	1.68	2.11
PSY	1-2 times	89	3.90	0.63	0.07	3.77	4.03
	3-4 times	48	3.72	0.94	0.14	3.45	3.99
	5-6 times	28	3.72	0.69	0.13	3.45	3.99
	7-8 times	19	3.75	0.81	0.19	3.36	4.14
	9 times or above	13	3.49	0.88	0.24	2.96	4.02
	None	35	3.74	0.85	0.14	3.44	4.03
ENJ	1-2 times	89	4.22	0.53	0.06	4.11	4.33
	3-4 times	48	2.27	0.71	0.10	4.06	4.47
	5-6 times	28	4.41	0.45	0.09	4.23	4.58
	7-8 times	19	4.22	0.58	0.13	3.94	4.50
	9 times or above	13	4.35	0.41	0.11	4.11	4.60
	None	35	3.90	0.87	0.15	3.60	4.20
AEF	1-2 times	89	4.04	0.66	0.07	3.90	4.18
	3-4 times	48	3.90	0.89	0.13	3.64	4.15
	5-6 times	28	3.98	0.60	0.11	3.75	4.21
	7-8 times	19	4.01	0.68	0.16	3.68	4.34
	9 times or above	13	4.11	0.60	0.17	3.75	4.47
	None	35	3.68	0.74	0.13	3.42	3.94
GOL	1-2 times	89	3.34	0.59	0.06	4.22	4.47
	3-4 times	48	4.21	0.69	0.10	4.01	4.41
	5-6 times	28	4.26	0.60	0.11	4.03	4.50
	7-8 times	19	4.27	0.60	0.14	3.98	4.57
	9 times or above	13	4.18	0.64	0.18	3.80	4.57
	None	35	4.00	0.86	0.15	3.70	4.30
MAS	1-2 times	89	4.04	0.57	0.06	3.92	4.16
	3-4 times	48	4.13	0.71	0.10	3.93	4.34
	5-6 times	28	3.98	0.67	0.13	3.72	4.24
	7-8 times	19	3.96	0.51	0.12	3.71	4.20
	9 times or above	13	4.12	0.65	0.18	3.73	4.51
	None	35	3.50	0.93	0.16	3.18	3.82
APP	1-2 times	89	3.00	0.75	0.08	2.84	3.16
	3-4 times	48	2.78	0.81	0.12	2.55	3.02
	5-6 times	28	2.81	0.78	0.15	2.51	3.12
	7-8 times	19	3.14	0.75	0.17	2.77	3.50
	9 times or above	13	3.05	0.90	0.25	2.50	3.59
	None	35	2.89	0.67	0.11	2.66	3.12
PHY	1-2 times	89	3.60	0.74	0.08	3.44	3.75
	3-4 times	48	3.53	0.73	0.10	3.32	3.74
	5-6 times	28	3.84	0.77	0.15	3.54	4.14
	7-8 times	19	3.87	0.70	0.16	3.54	4.21
	9 times or above	13	3.69	0.72	0.20	3.26	4.23
	None	35	3.60	0.76	0.13	3.34	3.86
COM	1-2 times	89	3.25	0.71	0.08	3.10	4.40
	3-4 times	48	3.27	0.77	0.11	3.05	3.49
	5-6 times	28	3.11	0.81	0.15	2.79	3.42
	7-8 times	19	3.23	0.51	0.12	2.98	3.48
	9 times or above	13	3.45	0.99	0.28	2.85	4.05
	None	35	2.69	0.76	0.13	2.43	2.95

Affiliation – AFF
Appearance - APP
Competition/Ego - COM
Enjoyment - ENJ
Golf Unique - GOL
Mastery - MAS
Other Expectations - OTH
Physical Condition –PHY
Psychological Condition -PSY

Table 8. One-way ANOVA- Between Motivations and frequency of playing golf

	Motivations		Sum of Squares	df	Mean Square	F	Sig
OTH	Between Groups		2.57	5	0.51	1.11	0.36
	Within Groups		104.54	226	0.46		
		Total	107.11	231			
PSY	Between Groups		2.73	5	0.55	0.91	0.47
	Within Groups		135.24	226	0.60		
		Total	137.96	231			
ENJ	Between Groups		4.83	5	0.97	2.49	0.03
	Within Groups		87.57	226	0.39		
		Total	92.40	231			
AEF	Between Groups		3.87	5	0.78	1.51	0.19
	Within Groups		116.25	226	0.51		
		Total	120.12	231			
GOL	Between Groups		3.06	5	0.61	1.40	0.23
	Within Groups		99.03	226	0.44		
		Total	102.09	231			
MAS	Between Groups		9.61	5	1.92	4.18	0.00
	Within Groups		103.98	226	0.46		
		Total	113.59	231			
APP	Between Groups		2.86	5	0.57	0.97	0.44
	Within Groups		132.70	226	0.59		
		Total	135.56	231			
PHY	Between Groups		3.03	5	0.61	1.10	0.36
	Within Groups		124.33	226	0.55		
		Total	127.36	231			
COM	Between Groups		10.49	5	2.10	3.78	0.00
	Within Groups		125.48	226	0.56		
		Total	135.961	231			

Affiliation – AFF
Appearance - APP
Competition/Ego - COM
Enjoyment - ENJ
Golf Unique - GOL
Mastery - MAS
Other Expectations - OTH
Physical Condition –PHY
Psychological Condition -PSY

Discussion

Are golfers motivated by golf unique motivation factors more than the motives factors in PALMS?

The current research suggested that the golf unique motivation was strongly relayed to PALMS. Golf unique motivation including "no age limitation", "play as an individual game", "self-discipline game", "decrease of relinquishing" and "enjoy natural environment" (M=4.24, SD=0.66) was ranked the highest among the eight PALMS factors. Golf is a kind of 'holistic' sport which is popular among mid-aged and older people (Luscombe, et al., 2017). It does not have any age limitation constraints while people can play golf even in older ages. Referring the statistics in National Golf Foundation (2016), the population covered golfers between 6 years old to 70 years old or above. Golf Australia's annual report (2015) stated 3% of golf members aged below 18 years old with 55% allocation for age 55 years old or above. It indicated that golf fits people at different ages as their healthy lifestyle physical activity.

Which is the major factor motivates golfers among PALMS?

The result of enjoying natural environment was the highest sub-scale among all 45 items. The photosynthesis converts carbon dioxide to oxygen and provides plenty of oxygen for the golfers on the golf course. The natural environment helps reduce golfer's negative emotions (e.g. anger, fatigue, energy, anxiety and sadness) (Bowler et al., 2010). The eight dimensions of PALMS: enjoyment, psychology condition, master & physical condition and affiliation have the positive strong correlation with golf unique motivation. It indicated further studies for golf unique motivation might be one of the factors added in specialized for related golf research.

The highest motivation factors in PALMS

Among PALMS, enjoyment motivation was the highest among the other motivation factors which is consistent with the Malaysian golf study (Molanorouzi, Khoo & Morris, 2015). Moreover, enjoyment and health were the top two important factors for Middle Ages Chinese women to physical activity participation (Sit, Kerr, & Wong, 2008).

The top three highest mean of motivation factors items were "because it's interesting", "because it's make me happy", "because it's fun", "because I enjoy exercising" and "because I have a good time". Those factors were intrinsic which contributed to self-actualization to enjoy the time with different emotion of the own voluntary choices. (Deci, 1975). Hong Kong people always suffer from family, working, living, studying issues. Playing golf may be able to alleviate the stress situation in Hong Kong.

Are there any motivator differences between gender, age group, playing ability and frequency of playing golf in golf participation in Hong Kong?

There is no significant difference between motivations and gender in Hong Kong. Enjoyment motivation scored the top from male golfers while golf unique motivation scored top from female golfers. The current finding showed males and females were motivated by intrinsic enjoyment and mastery. Supported by Sit, Kerr, & Wong (2008), enjoyment was one of the most important motivating factors for middle-aged Chinese women to physical activity participation and followed by health and appearance. Compared with the research in the USA regarding gender difference, the most significant factors were affiliation and competition in college students for physical activity (Kilpatrick, Hebert & Bartholomew, 2005).

65 years old or above demonstrated higher score on the "other expectation motivation factors" than the 13 to 18 years and 19 to 64 years old groups. It is speculated that this age group would like to excel in golf skills and scores after retirement. On the other hand, younger age group prefers more active physical activity such as play, game and recreation (World Health Organization, 2010). With regards to the 12 years or below group, usually they will not have other expectation other than PALMS factors.

Both 12 years or below and 13 -18 years old groups indicated higher scores on "mastery motivation factors" than 19 to 64 years and 65 years old or above. Younger age groups may be more sensitive to scores and desire to be a more competent and competitive players among peers. Consequently, they may display a higher incentive on "mastery motivation factors" than their counterparts. Older adults may look for relaxation or other golf unique factors in golf other than competition and scores. The score of competition/ego factors in 12 years or below and 13 to 18 years are higher than 19 to 64 years. It showed the age below 18 would like to have higher achievement and competition motiving them to golf participation.

Golf can fit in different ability level which is defined as their handicap level. The current findings showed that the scratch was the higher mean score of the mastery than the non-handicap holder, 10-19, 9 and 20-29.9 respectively. Scratch golfers defined as the top golfers in the field. The motivation of mastery attracted the top players to play golf more frequent. With the findings above scratch golfers' are motivated by mastery experience than other competition motives.

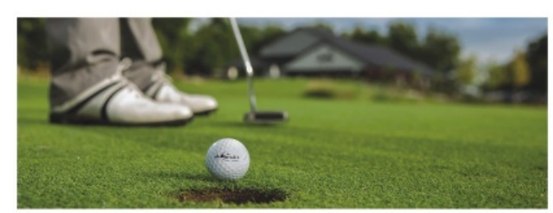
The findings showed that those golfers play 5-6 times of 18 holes are highly motivated by enjoyment. Those golfers who cannot have chances to play any rounds of golf average in a month is less motivated by competition/ego than 1-2 times, 3-4 times and 9 times or above. Those golfers will play less golf as they may not put competition/ego as their key motivations.

Conclusion

The present study intended to investigate local golfer's participation motives. It is found that enjoyment factor is the most important factor in PALMS. But Hong Kong golfers are mainly motivated by "golf unique motivation factors" more than the motives in PALMS.

Limitation

The research questionnaire was in English which may affect the respondent rate of golfers who do not use English as their language. Moreover, the questionnaire is based on the online version that may hesitate those not good at using internet. The sample is only from Hong Kong Golf Association squad member and their parents/ friends. Most of the golfers are keen golfers and have more than 3 years or above experience. RMA



References

Barnicle, S., & Barnes, J. (2015). Closing the deal: Sport enjoyment and the public relations of business golf. Journal of Contemporary Athletics, 9(2), 61-73.

Bowler, D. E., Buyung-Ali, L. M., Knight, T. M., & Pullin, A. S. (2010). A systematic review of evidence for the added benefits to health of exposure to natural environments. *BMC public health, 10*(1), 456.

Centre for Health Protection (CHP) of the Department of Health (2017, December 18). Press release Retrieved April, 2018, from https://www.chp.gov.hk/en/statistics/data/10/27/111.html

Census and Statistics Department. (2018, February 13). Press release Retrieved April, 2018, from https://www.censtatd.gov.hk/press_release/pressReleaseDetail.jsp?charsetID=1&pressRID=4213

Coon, D. & Mitterer, J. O. (2010). Introduction to psychology: Gateways to mind and behavior with concept maps. Belmont, CA: Wadsworth.

Deci, E. L., & Ryan, R. M. (2000). The" what" and" why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological inquiry,* 11(4), 227-268.

Deci, E. L. (1975). . Plenum Press, New York. *Intrinsic Motivation*.

Golf Australia. (2015). Research Summary Report: Golf Participation Report 2014. Retrieved February 10, 2018 from http://www.golf.org.au/site/_content/document/00024522-source.pdf

HAB216 Controlling officer's reply (n.d.), Retrieved February 20, 2017, from http://www.lcsd.gov.hk/en/common/images/en/doc/HAB216_e.pdf

Hawkes, R., Malik, O., & Murray, A. (2016). Golf: A matter of life and death, health and happiness, or just Olympic medals? *British Journal of Sports Medicine, 50*(11), 637-8.

Jo, Y. G., Lim, J. S., & Yang, C. H. (2016). Relationship among Participation Motivation, Immersion on Game, and Exercise Performance of Golf Players. *Indian Journal of Science and Technology, 9*(41).

Kilpatrick, M., Hebert, E., & Bartholomew, J. (2005). College students' motivation for physical activity: Differentiating men's and women's motives for sport participation and exercise. *Journal of American College Health, 54*(2), 87-94.

Kung, K. (30 July 2015). *Hong Kong golf course, doomed by airport shopping and hotel expansion, may move to former landfill site. South China Morning Post. Retrieved 20 February 2017.*

Li, C. P. (2011). An analysis of motivation, constraints, and satisfaction among recreational golfers in Taiwan. *United States Sports Academy. , 57*.

Luscombe, J., Murray, A. D., Jenkins, E., & Archibald, D. (2017). A rapid review to identify physical activity accrued while playing golf. *BMJ open, 7*(11), e018993.

Molanorouzi, K., Khoo, S., & Morris, T. (2014). Validating the physical activity and leisure motivation scale (PALMS). BMC public health, *14*(1), *909*.

Molanorouzi, K., Khoo, S., & Morris, T. (2015). Motives for adult participation in physical activity: type of activity, age, and gender. BMC public health, *15*(1), 5.

Murray, A. D., Daines, L., Archibald, D., Hawkes, R. A., Schiphorst, C., Kelly, P., ... & Mutrie, N. (2016). *The relationships between golf and health: a scoping review*. Br J Sports Med, bjsports-2016.

Murray, A. D., Daines, L., Archibald, D., Hawkes, R. A., Schiphorst, C., Kelly, P. & Mutrie, N. (2016). *Infographic. Golf and health*.

National Golf Foundation (NGF). (n.d.). Share of golf players in the United States by age group in 2016*. *In Statista - The Statistics Portal*. Retrieved March 7, 2018, from https://www.statista.com/statistics/761977/us-golf-player-demographics-age-groups/.

Nance, V. L., Davis, E. C., & McMahon, K. E. (1998). *Golf. Boston,* MA: WCB McGraw-Hill., .2-3. *(Borrow aaa)*

Qiu, Y., Lin, Y., & Mowen, A. (2018). Constraints to Chinese women's leisure-time physical activity across different stages of participation. *World Leisure Journal, 60*(1), 29-44.

Rogers, H., Morris, T., & Moore, M. (2008). A Qualitative Study of the Achievement Goals of Recreational Exercise Participants . *The Qualitative Report, 13*(4), 706-734

Roychowdhury, D. (2018). A comprehensive measure of participation motivation: Examining and validating the Physical Activity and Leisure Motivation Scale (PALMS). Journal of Human Sport and Exercise, 13(1), 231-247

Sansone, C., & Harackiewicz, J. M. (2000). *Intrinsic and Extrinsic Motivation : The Search for Optimal Motivation and Performance*. San Diego: Academic Press Retrieved from https://books.google.com.hk/books?id=DyeOd0Vb5lQC&lpg=PP2&ots=sVYKktV0dM&dq=Intrinsic%20and%20Extrinsic%20Motivation%20%3A%20The%20Search%20for%20Optimal%20Motivation%20and%20Performance.%20San%20Diego%3A%20Academic%20Press&lr&pg=PP2#v=onepage&q&f=false

Secretary for Financial Services and the Treasury. (2018). The 2018-19 Budget, *Hong Kong Special Administrative Region Government of the People's Republic of China (2018, February 28)*. Retrieved March 10, 2018, from https://www.budget.gov.hk/2018/eng/speech.html

Shim, K. R., Paek, B. J., Yi, H. T., & Huh, J. H. (2017). Relationships between golf range users' participation motivation, satisfaction, and exercise adherence intention. *Asia Pacific Journal of Innovation and Entrepreneurship, 11*(1), 50-62.

Sit, Kerr, & Wong. (2008). Motives for and barriers to physical activity participation in middle-aged Chinese women. *Psychology of Sport & Exercise, 9*(3), 266-283.

The R&A. (2017) (n.d.), *Golf Around the world 2017*, Retrieved February 20, 2018, from https://www.randa.org/TheRandA/AboutTheRandA/DownloadsAndPublications

USGA (2017) (n.d.) *World Handicap System in the Works*, Retrieved April 17, 2017, from http://www.usga.org/content/usga/home-page/articles/2017/04/world-handicap-system-in-the-works.html

Weed, M., Coren, E., Fiore, J., Wellard, I., Chatziefstathiou, D., Mansfield, L., & Dowse, S. (2015). The Olympic Games and raising sport participation: a systematic review of evidence and an interrogation of policy for a demonstration effect. *European Sport Management Quarterly*, 15(2), 195-226.

Williams, N., Whipp, P., Jackson, B., & Dimmock, J. (2012). Relatedness Support and the Retention of Young Female Golfers. *Journal of Applied Sport Psychology, 25*(4), 412-430.

World Health Organization. (2010). Global recommendations on physical activity for health. *Geneva: World Health Organization*; 2010.

World Amateur Golf Ranking (2018) (n.d.), Retrieved April 22, 2018, from http://www.wagr.com/

Zach, S., Bar-Eli, M., Morris, T., & Moore, M. (2012). Measuring motivation for physical activity: An Exploratory Study of PALMS – the physical activity and leisure motivation scale. Athletic Insight, 4(2), 141-154.

Zhang, M. L. (2007). An analysis of recreational golfer motivation, constraints, and satisfaction on the mastery and frequency of play in the Gulf Coast region of Mississippi.*United States Sports Academy*, 110.


香港海洋公園萬豪酒店 (黃竹坑)


屯門公園共融遊樂場 (屯門)


做灘住客會所 (清水灣)


調景嶺體育館 (將軍澳)

“遊玩就是小孩的工作”
– 瑪利亞·蒙特梭利

“Play is the work of the child”
- Maria Montesorri


香港加拿大國際學校 (黃竹坑)

專供世界
頂級運動及康樂設備
The Professionals in Sports,
Recreational &
Landscaping Facilities


八鄉少訊中心 (元朗)


弘立書院 (薄扶林)


One Homantin 住客會所 (何文田)