Research Assessment Exercise 2020
Impact Case Study

University: The Chinese University of Hong Kong
Unit of Assessment (UoA): UoA#40-physical education, sports recreation & physical activities
Title: Increasing physical activity among children and adolescents: Rope skipping for active schools and communities

(1) Summary of the impact (indicative maximum 100 words)

This case study demonstrates how theory-driven, evidence-based research at The Chinese University of Hong Kong led to higher activity levels of local youngsters through rope skipping. Rope skipping is a form of moderate-to-vigorous physical activity which requires little space and equipment. Our beneficiaries include over 390,000 individuals from 340 schools. The Hong Kong Rope Skipping Association, founded by our members, built a strong foundation of the sport at grass root levels through outreach programmes. Rope skipping has become one of five physical activities being promoted in government-led health promotion campaigns. In the process, world champions and record-breaking athletes were nurtured.

(2) Underpinning research (indicative maximum 500 words)

Research described in this case study, led by Amy Ha (1989-present, Professor), sought to: (1) identify effective modes of physical education (PE) or physical activity (PA) intervention delivery; (2) understand how autonomous motivation, i.e., motivation to obtain enjoyment or personally valued outcomes, promote PA; and (3) design and evaluate rope skipping-based interventions. Other researchers who contributed to this case study include Raymond Sum (2001-present, Associate Professor), Daniel Chan (1993-present, Senior Lecturer), Chris Lonsdale (2005-2008), and Angus Burnett (2010-2014).

Early research conducted by our researchers found that Hong Kong's confined school and living environments hindered children's PA levels. Within school contexts, rigid timetables and limited facilities were identified as barriers to promoting positive PA changes. In 2002, the Education Bureau (EDB) introduced reforms to the PE curriculum. Being one of the eight Key Learning Areas identified, PE teachers had to apply new strategies to promote generic skills through their teaching. Our research (3.1; *N*=183), commissioned by the EDB, found that in-service professional development was a valuable form of support to physical educators. We also identified that rope skipping (RS), being a form of moderate-to-vigorous PA (MVPA), had possibilities of including fun elements, required little space and equipment, and was thus well-suited to the local environment.

We also examined motivational mechanisms that supported PA participation. Based on self-determination theory, a psychology theory on human motivation and behaviour, we examined the relation between psychological constructs and objectively-measured (using accelerometers) PA in the PE (3.2; *N*=528 students) and leisure-time MVPA contexts (3.3; *N*=115). We found that behaviours that supported students' psychological needs (competence, autonomy, relatedness) and autonomous motivation were important antecedents to PA in both contexts. Specifically, PA interventions should aim to foster climates in which participants can experience success (e.g., having a wide range of difficulty; competence), be fun (autonomy) and have room for friendly interactions (relatedness).

Building on the above work, two intervention programmes incorporated professional development components with RS as the key activity were evaluated. In the first study (3.4; *N*=1,386), a 4-week,

whole-school randomised controlled trial (RCT) was conducted. The programme was well-received by teachers and students; the experimental group, compared to control, reported higher scores on some aspects of quality of life. In another 8-week RCT (3.5; *N*=731), we evaluated a RS intervention designed for PE settings. In-service teachers were trained to provide an eight-lesson intervention, using instructional approaches that supported students' psychological needs. The intervention was effective in terms of increasing MVPA for girls, who were generally less active than boys. These findings suggest RS can be promoted to improve PA in specific groups of participants.

By employing dual-energy X-ray absorptiometry in a longitudinal study with 176 pubertal girls (3.6), we found that participants who engaged in RS regularly had higher bone mineral density in their lower limbs, compared to non-rope skippers, indicating a better bone health among the skippers. Collectively, RS, being a space-saving, fun, high-intensity activity requiring limited equipment, has strong potential to be used as an intervention tool to enhance PA and health.

[498 word]

(3) References to the research (indicative maximum of 6 references)

Peer-reviewed journal articles:

3.1 Ha, A. S., Lee, J. C. K., Chan, D. W., & Sum, R. K., (2004). Teachers' perceptions of in-service teacher training to support curriculum change in physical education: The Hong Kong experience. *Sport, Education and Society, 9*, 421-438.

3.2 Lonsdale, C. Sabiston, C. M., Raedeke, T. D., Ha, A. S. C., Sum, R. K. W. (2009). Self-determined motivation and students' physical activity during structured physical education lessons and free choice periods. *Preventive Medicine, 48,* 69-73.

3.3 Ha, A. S., & Ng. J. Y. Y. (2015). Autonomous motivation predicts 7-day physical activity in Hong Kong students. *Applied Psychology: Health & Well-Being, 7*, 214-229.

3.4 Ha, A. S., Burnett, A., Sum, R., Medic, N., & Ng, J. Y. Y. (2015). Outcomes of the rope skipping 'STAR' programme for schoolchildren. *Journal of Human Kinetics, 45*(1), 233-240.

3.5 Ha, A. S., Lonsdale, C., Ng, J. Y., & Lubans, D. R. (2017). A school-based rope skipping program for adolescents: Results of a randomized trial. *Preventive Medicine, 101,* 188-194.

3.6 Ha, A. S., & Ng, J. Y. (2017). Rope skipping increases bone mineral density at calcanei of pubertal girls in Hong Kong: A quasi-experimental investigation. *PloS one, 12*(12), e0189085.

(4) Details of the impact (indicative maximum 750 words)

Our RS research has directly and indirectly led to significant impact in several ways. Unless otherwise stated, the figures presented below relate to impact activities between October 2013 and September 2019. Within this period, our rope skipping-related initiatives have attracted funding over HK$28,800,000.

Enhanced PE Professional Development and Training

Based on our research, a wide range of learning and teaching materials for RS, in forms of printed booklets, online resources, and video media were disseminated to schools in Hong Kong (5.01). The Education Bureau also commissioned our department to host the Summer School for PE Teachers,

an annual professional development programme, between 2012 and 2016 (5.02). Rope skipping workshops were offered to participants, which totalled 1,478 teachers. Our department also provided professional training to pre-service PE teachers. Rope skipping professional skill courses are currently offered to students in our undergraduate PE and Sports Science programmes annually. More in-depth professional training was also provided to teachers who took part in our research studies (3.3 to 3.5). Teachers from 116 schools have taken part in these studies. These efforts have allowed many students to experience the activity within their own schools.

Physical Activity Promotion Programmes

Envisioning the need and potential impact from our work in RS and PA promotion, our department enthusiastically supported the establishment of the Hong Kong Rope Skipping Association (HKRSA, http://www.hkrsa.com/) in 1997, which was the first of its kind in Hong Kong. Since then, our staff members (Ha, Chan, and Sum) have taken influential leading roles in HKRSA. The work of HKRSA and the department have been intertwined. Our department, the HKRSA, and other organisations have worked in tandem on various fronts to promote PA through RS, or the sport itself. For example, the department has attracted over HK$7,700,000 to promote RS to schools and communities and to conduct related research through the Skipping to Happiness programme (www.skippingtohappiness.com). This funding has benefited more than 60,000 students and general public. Also, HKRSA has collaborated with the Hong Kong College of Cardiology on the Jump Rope for Heart programme since 1999 (5.03). The programme served over 50,000 students annually by organising health promotional campaigns and interschool competitions. The programme is the largest RS event, in terms of participants, in Hong Kong.

The Hong Kong Rope Skipping Association collaborated with the Hong Kong Leisure and Cultural Services Department (LCSD) and Department of Health to create instructional materials on RS for the territory-wide Healthy Exercise for All Campaign (5.04). In this campaign, RS was selected as one of five activities (together with walking, running, dancing, and hiking) "to encourage different sectors of the community to organise activities to promote a sporting culture and a healthy lifestyle". In 2019, we further received funding in excess of $11,000,000 (5.05) from the Hong Kong Jockey Club Charity Trust (HKJCCT) to conduct school- and family-based RS classes, and this is expected to increase PA in over 12,000 individuals in the community. In 2017, HKRSA also supported the National Youth "Future Star" Sunshine Sports Games held in Ningxia (5.06), an event aimed to "promote wellness for all, enhance public interest in youth sports, and promote an Olympic culture among young people". In acknowledgement of our rope skipping-promotion efforts, we further received HK$63,800,000 to promote PA in local primary schools (5.07).

Contributions to Elite Rope Skipping

By building a strong foundation at grass root levels, the impact of our department also extends to elite levels of RS via HKRSA. With support from HKRSA, Hong Kong representatives excelled in international competitions, breaking 16 Asian/World records en route to winning 311 medals in the Asian and World championships (5.08). The Hong Kong team became household names when footages of them breaking a world record was viewed over 388,000 times on social media; the story was also widely covered in print media. To further promote RS to the local community, HKRSA received funding in excess of HK$5,300,000 from LCSD (5.09) and HKJCCT (5.06) for hosting the World Rope Skipping Championships in 2014, and the Asian Championships in 2019. Staff and students from our department were actively involved in these competitions. The outstanding achievements of our athletes also won us the "Leader of the Year" award (5.10) from the Sing Tao Newspaper Group, for having "taken a leading role in the development of their field and acted as a role model", and "enhanced the positive image and international reputation of Hong Kong".

[730 words]

(5) Sources to corroborate the impact (indicative maximum of 10 references)

5.01 An example of a teacher handbook containing rope skipping teaching materials and related information.
5.02 Support letter from the Education Bureau for the hosting of the Summer School for PE Teachers
5.03 Hong Kong College of Cardiology collaboration letter on the "Jump Rope for Heart" programme
5.04 "Healthy Exercise for All" campaign – "Rope Skipping for Fun" programme materials: https://www.lcsd.gov.hk/en/healthy/rope.html
5.05 Support letter from the Hong Kong Jockey Club Charities Trust for the "School and Community Outreach Rope Skipping Programme"
5.06 Support letter from the Leisure and Cultural Services Department - Sunshine Sports Games
5.07 Support letter from the Hong Kong Jockey Club Charities Trust for the "Sport and Physical Activity Development Model for Primary Schools"
5.08 Endorsement letter from Leisure and Cultural Services Department on the performance of rope skipping athletes in the Asian (2019) and World (2014) Championships
5.09 Support letter from the Leisure and Cultural Services Department on funding provided for the Asian (2019) and World (2014) Championships held in Hong Kong
5.10 Sing Tao Newspaper Group – Leader of the Year award letter