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Parkour and Intrinsic Motivation: A Mixed Methods Analysis of Self-Determination Theory in an Emerging Youth Sport

A thesis submitted in partial satisfaction of the requirements for the Master's degree

in

Public Health

by

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  James Sallis

2020

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TABLE OF CONTENTS

ACKNOWLEDGEMENTS

I would like to acknowledge Professor Britta Larsen for her support as the chair of my committee. Through the entire research and writing process she has been an exceptional help.

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ABSTRACT OF THE THESIS

Parkour and Intrinsic Motivation: A Mixed Methods Analysis of Self-Determination Theory in an Emerging Youth Sport

by

Jacob Carson

Master of Public Health

University of California San Diego, 2020

Professor Britta Larsen, Chair

Physical activity is important for improving lifelong health and wellness, yet only a quarter of US children meet physical activity guidelines. Highly competitive youth sports may impact youth dropout and providing alternative options to be active may be a solution. Self-Determination Theory, a psychological theory around the idea of intrinsic versus extrinsic motivation, is an underutilized framework that may be helpful in addressing this issue. We employed a mixed method design to understand how Parkour, an emerging youth sport, may better address psychological needs as defined by Self-Determination Theory. Cross-sectional survey data from 38 children/adolescents (ages 7-17) enrolled in Parkour versus other sports were compared, and 15 of the Parkour participants were individually interviewed to gain a deeper understanding. There were significant differences between the two groups for their

motivations and physical activity habits, and the addition of the qualitative data illustrates the

potential advantages of Parkour to reach children who may be otherwise uninterested. This study

provides an important background for future research into Parkour that has thus far been limited.

Introduction

Current physical activity guidelines recommend that children (ages 5-17) should engage in 60 minutes of daily moderate-to-vigorous physical activity, with at least three days a week being devoted to building muscle and bone strength.[1] Failure to meet these recommendations for physical activity is one of the greatest threats to public health and has been attributed to 8.3% of all mortality in the US.[2] Insufficient physical activity is responsible for a variety of morbidity complications. According to the Center for Disease Control (CDC), physical inactivity is associated with obesity, cardiovascular disease, hyperlipidemia, high blood pressure, lower bone density, and risk of developing type 2 diabetes.[3] Additionally, the CDC estimates that low levels of physical activity are associated with $177 billion in health care costs annually.[4] In 2017 only 24% of children met physical activity guidelines, while obesity prevalence in this age group is 18.5%.[3,5] The problem with low rates of physical activity is clearly a pressing issue here in the US, and despite moderate increases in recent years, overall physical activity still remains very low.[6]

As with many health behaviors, establishing healthy PA habits at a young age is an important strategy to creating population level change.[7] Analyses of US health report cards confirm that there are declines in physical activity from childhood into adolescence, emphasizing that physical activity promotion among children and adolescents is a public health priority.[7] Furthermore this decline in leisure-time physical activity has been observed from adolescence to adulthood.[8] These trends reinforce the idea that physical activity interventions may be most important in children and adolescents. Interventions that create positive perceptions of physical activity at a young age could be crucial for creating behaviors that translate to healthier lifestyles over time. Greater emphasis on understanding the specific determinants that impact physical

1

activity levels in these age groups is warranted. A statistic that lives at the heart of this problem is that 70% of children drop-out of organized sports by age 13 with a lack of fun being their primary reason.[9] This staggering figure leads us to an important question, what makes sports fun and enjoyable for children?

Motivation is at the center of this question, and as with many health behaviors, at the center of individual level behavior change. At the individual level, motivation, simply the desire to do something, is associated with a behavior.[10] Regarding physical activity, meta analyses support the idea that intrinsic, as opposed to extrinsic, motivators are more strongly associated with exercise adoption and long-term maintenance.[11] This finding is consistent among children and adolescents.[12,13] These studies not only found that intrinsic motivation is positively associated with physical activity, but more specifically that external regulation and amotivation are negatively associated.

Self Determination Theory

Self Determination Theory (SDT) may provide a useful framework to better understand these different types of motivation and the roles that they play. SDT is a psychological framework that focuses on the relationship of intrinsic versus extrinsic motivators in a social system for promoting behavior. While this theory is primarily focused on the individual factors that relate to health behaviors, the importance of other levels of the social ecological model in creating an environment where motivation can work effectively is acknowledged.[14] SDT describes the psychological needs for intrinsic motivation as three factors: Autonomy, Competence, and Relatedness. Autonomy means that the person needs to perceive the activity as their choice, competence implies that people feel capable of doing the activity, and relatedness is having a connection to people, akin to a sense of community or comradery. According to the

SDT, having these psychological needs met to a greater degree results in more autonomous or internally regulated types of motivation. Intrinsic motivation and introjected regulation (partially internalized motivation) are consistently associated with greater levels of physical activity and exercise.[11–13] Although the application of this theory to physical activity is not novel, the application of these ideas has widely been overlooked in the common ways that our youth and adolescents engage in activity.

There are gaps in the research on how different sports "perform" on meeting these psychological needs to make children/adolescents more autonomously motivated versus externally regulated (performing the activity for a prize or because an authority figure told them to). Despite the lack of research on these specifics, there has been discussion on why children drop out of sports. One such discussion by sports psychologists highlights specific reasons for drop out that can be observed in the traditional sporting options readily offered to US children.[9] This article cites no longer having fun is a commonly mentioned reason for drop out, and is specifically related to the strict rules that do not leave any room for creative problem solving or engagement. Children also report too much pressure from parents or coaches yelling on the sidelines, or that sports become overly time consuming with practices after school and games on weekends.[9] Complaints about reductions in playing time are also common, as sports become more competitive and less centered on the physical activity. These factors are categorized into four reasons for sport dropout: intrapersonal constraints, low perceptions of physical competence, intrinsic pressures (stress), and perceptions of negative team dynamics.[9] These identified reasons for sport dropout are analogous to the SDT framework discussed earlier, suggesting that we are failing to provide children with the autonomy and enjoyment they are seeking. Even in children who feel capable of high achievement in these sports, the highly

external, competitive nature pushes towards specialization at a young age, which can lead to burnout, injury, and eventual dropout.[15] The most common recreational sports offered to children/adolescents in the US such as soccer, basketball, baseball, and football, all rely on the same formula of structure and a high nature of competition. Children who excel are moved towards specialization while those who are not are discouraged by the competitive nature. There seems to be a lack of easily accessible options that provide physical activity for children who do not enjoy competitive team sports or feel that they are not talented enough to play. Even in physical education here in the US, time is spent learning the rules of traditional sports like basketball and football over learning more basic, lifelong physical activities that emphasize fitness over game play such as jogging or strength training.[16] As these traditional PE and recreational options do not consistently align with SDT, it seems justified to explore options that fit more readily into SDT to promote lifelong physical activity.

Parkour as an alternative

One potential alternative to these traditional sports is Parkour. Parkour is a traditionally non-competitive discipline that, similar to martial arts, promotes self-improvement. The practice was founded in the late 1980s in France, based off a military practice of using obstacle courses to promote functional fitness. A unique feature of Parkour is that the practice is primarily done in outdoor urban environments that are subverted from their intended use into places with large potential for physical activity. This subversion can be as simple as jumping down a stair set or balancing on a handrail. In Parkour, practitioners practice movement skills based on running, jumping, and climbing with the goal of improving their strength and adaptability. Parkour may also encompass movements from other disciplines including gymnastics and martial arts, allowing for more creative expression through acrobatics. Practitioners can be seen jumping over

and between walls, climbing buildings, and at the most extreme levels, traversing roof gaps and other precarious situations. Despite the common representation, Parkour training primarily takes place at ground level in urban spaces with diverse architecture, including universities, parks, and downtown centers.

Despite growing popularity, there has been limited academic research on Parkour and its potential for physical activity interventions or programs. What research does exist is promising in relation to SDT, but there have not been any studies explicitly examining Parkour through this lens. Parkour training has positive effects on cardiovascular fitness and has potential for improving athletic development in more traditional sports.[17,18] One study found that Parkour practitioners perceived wall height to be lower than non-practitioners, and they anticipated a greater ability to overcome the obstacle.[19] However, numerous qualitative studies examine Parkour through social or ecological lens to better understand the activity and the subculture that it may represent.[20–22] Relevant qualitative research suggests that Parkour may have a unique potential for reaching children who are uninterested in sports by cultivating a positive health identity and social environment.[23] The same researchers also suggest that Parkour may have high participation compared to other sports because of the freedom and flexibility that it provides,.[24] Specifically in a school setting, Parkour may be beneficial due to the high level of problem solving, social skills, fun, autonomy and competence.[25]

There is a major gap in quantitative research on Parkour and its potential impacts on motivation or physical activity in any group. A search for the key word "Parkour" results primarily in kinetics or kinematic research, with a handful of case studies related to injuries. One unique randomized control trial found that schoolchildren were more likely to participate in an organized Parkour recess versus a standard supervised recess.[26] Although the existing research

hints towards the positive aspects of Parkour for health promotion, the gaps are still too numerous to make evidence-based suggestions.

The present study is focused on exploring Parkour through the lens of SDT. This research used a mixed methods approach with the intention of more accurately understanding children/adolescent perspectives on Parkour, to see how it could potentially be used to improve physical activity habits and other health-related outcomes. Specifically, we sought to examine factors of intrinsic motivation in youth who participate in Parkour, and to compare these to children participating in more traditional competitive team sports. We also sought to measure and compare how these groups differed in their behaviors and attitudes towards physical activity. We then conducted semi-structured individual interviews with youth participating in Parkour to further expand upon the findings and better understand motivation for participation in Parkour.

Methods

This study utilized a mixed-methods research design, specifically an Explanatory Sequential Design (Figure 1).[27] This design entails an initial collection of quantitative data followed by qualitative data that serves to explain the results and makes up the majority of the findings. Quantitative data were cross-sectional and collected via self-report surveys. Qualitative data collection took place via semi-structured individual interviews. All study procedures were IRB approved, and parental consent/participant assent were received prior to their participation.

Setting

Data were collected over the course of 4 months from November 2019 to April 2020. The primary site for data collection was the APEX School of Movement San Diego, a Parkour facility located in central San Diego. This site was chosen because it is the only Parkour exclusive facility within a 25-mile radius and has a primary clientele that matched our age range of interest (7-17 years-old).

Eligibility

Inclusion Criteria

In order to be eligible for this study, participants had to be between 7-17 years of age, and able to speak, write and read English. Parkour participants must have an active membership at the APEX San Diego. Non-Parkour participants had to be involved in recreational sports with another organization in San Diego, not have had an active membership in the gym for ≥1 year, and not engage in Parkour (in the gym or elsewhere) more than once per month. The goal of these inclusion criteria was to clearly delineate between the Parkour and non-Parkour participants.

Exclusion Criteria

Potential participants were excluded if they had a serious medical condition that prevented them from participating in any physical activity. This was also to maintain a more consistent comparison group since those with serious medical conditions may have significantly different perspectives or habits related to motivation and exercise.

Quantitative Data Collection

Recruitment

This study used convenience sampling, a type of non-probability sampling that enrolls willing participants based only on their willingness to participate and meeting of the eligibility criteria.[28] Participants were recruited at the Parkour facility by using flyers and discussion of the research between the parents and the PI. Participants were allowed to finish the survey on-site or to take it home and return the survey the following week. Non-Parkour participants were primarily recruited from siblings of Parkour participants during the first phase (November 2019 – February 2020). We subsequently planned to partner with a local recreational sports league, but the timing of the COVID 19 lockdown resulted in this not being possible. In accordance with social distancing, the survey was shifted online, and the final five participants were recruited using snowball-sampling, a non-probability sampling method where participants invite their social networks to participate.[29] This resulted in a total of 38 study participants: 27 in the Parkour group and 11 in the non-Parkour group.

Variables and Measures

All study participants provided basic data on their age, sex, and sport of interest. Sport of interest was a fill-in-the-blank slot. Two different surveys were used and given together, the

Intrinsic Motivation Inventory (IMI) and the Patient-Centered Assessment and Counseling for Exercise Plus Nutrition (PACE +) surveys. Parkour participants also had visit data accessed from the gym database including the number of unique visits (excludes back-to-back classes or open gym use) to the gym and the number of months they have been attending the gym to analyze if time involved in Parkour had any significant association with the variables of interest.

Intrinsic Motivation Inventory (IMI)

The IMI is a multidimensional measure of task related experience based in SDT. This measure was chosen as a direct measure for intrinsic motivation. the tool showed high Cronbach alphas for internal consistency ($\alpha = .85$) for the four different subscales: interest/enjoyment ($\alpha = .78$), perceived competence ($\alpha = .80$), effort ($\alpha = .84$), and pressure/tension ($\alpha = .68$).[30] This scale and its subscales have been used in multiple adolescent populations since validation.[31–33] This tool was chosen due to its simplicity in assessing task related motivation. There are multiple versions of the survey, but the standard 22-item version assesses four subscales: interest/enjoyment, perceived competence, perceived choice, and pressure/tension.[34] The four subscale scores of each participant were calculated and used in data analyses.

Physician-Based Assessment and Counseling for Exercise (PACE +)

The PACE + is a validated physical activity measure for adolescents designed for use in primary care settings.[35] This measure was chosen to assess physical activity levels of the participants and also includes various subscales such as self-efficacy and peer influences. The entire survey is broken up into seven sections making a total of 47 questions primarily on a Likert-scale. This measure has been validated in adolescents to correspond with physical activity stages and objective measure of physical activity.[36,37] The survey provides eight subscale scores

9

that were used in the final analyses: Stage of Change, Change Strategies, Pros, Cons, Self-Efficacy, Family Support, Friend Support, and Environmental Influences.

Analyses

Due to the small sample size and non-normal distribution, the Mann-Whitney U-Test (also known as the Wilcoxon Rank-Sum Test) was used to compare subscale scores between groups rather than standard two-sample t-tests. This is a rank-based test that compares median rather than mean and is thus more suitable for smaller sample sizes. Analyses compared Parkour participants to all non-Parkour participants. Comparison by specific other sport (i.e. Soccer or Basketball) was not possible due to the small number of participants from each sport. Statistical significance for the Mann-Whitney U-Test was set at $\alpha = .05$. Participants with missing data were not included in calculations for the corresponding subscales. In addition to the primary comparison tests, correlation tests were performed for each subscale from both the IMI and PACE+ for number of visits and months enrolled at the Parkour gym. Correlational significance for the linear regression models was also set to $\alpha = .05$. All statistical analyses were performed using IBM SPSS Statistics 26 for Windows.[38]

Qualitative Data Collection

Recruitment

All Parkour participants from the quantitative portion were contacted via email and asked if they would be willing to participate in the interviews starting in the middle of March 2020 through the end of the month. A total 15 participants were drawn from the quantitative portion and enrolled in the qualitative portion and sent the informed consent via email. Further email

correspondence related to the purpose of the study and clarification of assent/consent were conducted by the PI.

Interview Structure

Interviews were originally intended to be conducted in person on-site. However to accommodate COVID 19 restriction for social distancing, the research plan was amended to carry out interviews using the Zoom application, which is a teleconferencing platform.[39] All interviews were conducted by a MPH student who had no personal relationship with the students and was not involved in Parkour in any way to reduce potential response bias. Verbal consent to collect the audio recordings of the interviews was collected prior to the start of the interview in addition to being included on the informed consent forms. Individual interviews ranged from seven minutes up to 18 minutes including pre and post interview logistics and discussion. All questions and probes were included in an interview guide that was consistent for all interviews. Three sub-questions were added after the first two "pilot interviews" to ensure that the topics of interest were being answered by the remaining 13 participants.

Questions included in the interview guide (see Appendix) were designed to be easily understood for the entire age group (as young as seven), and covered such topics as how they became involved in Parkour, what they like about it compared to other sports, their goals for the sport, and their perceptions on competitions. The goals of the interviews were to capture a broad understanding of how they felt about Parkour and if themes related to Self-Determination Theory (SDT) would be present without explicit prompting from the interviewer. All interview participants were given a $10 Amazon gift card to compensate them for their time.

11

Interview recordings were transcribed by the PI using Otter.ai, a secure online platform that automatically performs a rough transcription.[40] The interview transcripts were reviewed against the audio recording to correct any inaccuracies during the transcription process.

Analyses

A standard content analysis approach was used in line with the aims of the study.[41] Complete transcriptions were uploaded onto Dedoose, a web-based qualitative analysis platform.[42] The coding schema for the qualitative data were initially developed *a priori* from the interview guide questions. Additional descriptive codes were added as needed to label novel or emergent content not outlined by the interviews, respectively. All excerpts selected during this process were summarized for consistent language and ease of understanding before moving onto secondary coding. Second cycle coding was performed using both focused and axial coding. Focused coding is used to inclusively categorize coded data on thematic similarity, and axial coding is used to relate categories and subcategories of codes into patterns for similarity.[43] This level of coding was facilitated through the use of a mapping tool known as Lucidchart, which is a visualization and diagram creation software.[44] The resulting visual maps and direct quotations from study participants resulted in three major overlapping themes aligned with the specific aims of the study. Coding was performed primarily by the PI and reviewed with a qualitative research specialist to maintain a high level of rigor. Any disagreements in the application of primary and secondary coding labels were resolved through discussion and consensus between the PI and qualitative research specialist.

Data Security

All paper surveys were deidentified with each participant receiving a participant code that was on any survey documents and used in the database. Online surveys post COVID 19 were all submitted to be entirely anonymous. Paper surveys were kept in a locked file cabinet that only the PI had access to, and computer data was stored on a Dropbox, secured by AES encryption standards, during the entirety of the study.[45]

Audio recordings were downloaded directly from Zoom to the interviewer's computer before being uploaded to Otter.ai. All audio transcripts and recordings were deleted from Otter.ai after transcription and stored in a secure Dropbox. After analyses on Dedoose were completed the interview transcripts were deleted from the platform.

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Results

Quantitative Results:

Sample Characteristics

The mean age of the entire sample (N=38) was 11.39 years old, with the majority of participants being male (Table 1). The mean ages of the Parkour group (n=27) and the non-Parkour group (n=11) were similar, but the non-Parkour group had a more equal gender distribution (Table 1). The non-Parkour group included five Soccer players, two Jujitsu practitioners, and one of each who played Tennis, Basketball, and Volleyball. In the Parkour group the mean number of unique visits to the gym was 42.44 (over their period of enrollment at the gym) and the average time they had been attending the gym was 13 months.

From the Intrinsic Motivation Inventory (IMI) two of the four subscales showed significant differences between the two groups (Table 2). As seen in Figure 2B, participants in the Parkour group (Mean Rank = 17.15) reported lower competence than the Non-Parkour group (Mean Rank = 25.27; p = .041). As seen in Figure 2D, Parkour participants (Mean Rank = 22.56) reported higher pressure than the Non-Parkour group (Mean Rank = 12.00; p = .007), indicating that they felt more pressure to perform well in their sport. The other subscales, Interest/Enjoyment, and Perceived choice were not significantly different between the two groups (Table 2).

From the (PACE +) three of the eight subscales had statistically significant differences between the two groups (Table 3). Physical activity stage (Graph 3A) was significantly lower in the Parkour group (Mean Rank = 16.98) than in the Non-Parkour group (Mean Rank = 25.68; p = .027), meaning that they report exercising less and have less intention to increase their activity

over the next 6 months. Likewise, physical activity change strategies (Graph 3B) were significantly lower in the Parkour group (Mean Rank = 16.46) versus the Non-Parkour group (Mean Rank = 25.85; p = .017), indicating that they do not use strategies to increase their physical activity. Peer influences (Graph 3G) were also significantly lower in the Parkour group (Mean Rank = 16.93) compared to the Non-Parkour group (Mean Rank = 25.82; p = .025), indicating they had fewer friends who were physically active or supportive of physical activity.

There were no significant correlations or trends between number of visits or months enrolled in Parkour classes with any of the IMI or PACE+ subscales (Tables 4 and 5).

Qualitative Results:

Sample Characteristics

Of the 15 interview participants, 14 were male and only one was female. The participants' ages ranged from 7 to 17 years, with a median age of 12 years. The interview participants had a mode of 36 unique visits to the gym, and 12 months of attending, which is very similar to the central tendencies of the quantitative sample. The quantitative Parkour sample is about half the size of the qualitative sample, consistent with an explanatory sequential design.

Appendix 1 includes the interview used to explore the core question "What are the motivations of kids who do Parkour?" Participants responded to questions centered around the three core themes in Self-Determination Theory: Autonomy, Competence, and Relatedness. Using these core themes to organize the results of the interviews provides insight into our primary research aims.

Autonomy

Introduction to Parkour

      As seen in Figure 4A, the participants' introductions to Parkour were split between dependent (introduced by a friend or family member) or independent (discovered on their own, with a greater emphasis towards independent introduction). Dependent introduction was primarily from parents who brought them to try a class, or a friend who was already taking Parkour classes. Independent introduction was initiated through a variety of modalities, including YouTube videos, video games, TV shows, or personal desires to learn acrobatic Parkour skills.

      I was watching the show that I really liked when I was a kid. And there's just one character that did a lot of Parkour moves, he was like the coolest guy. And then I looked up what those like moves were called I figured out it was Parkour.

Fluid Structure

      When participants were asked what they enjoyed about Parkour (Figure 4B), many reported preferring to take part in activities that involved a flexible and less rigid structure. Having less structure was specifically stated by a third of participants as one of the unique factors to Parkour (Figure 4C). This loose structure was reported alongside feelings of creativity and fun as the major reason that students engaged in Parkour.

      I really like that it's determined by you, there is no one telling you, oh, you have to go this way or you have to do this type of vault. You can basically like, choose it all yourself and like, kind of suit your own path. Um, so if you don't know, you can like push yourself to you can push yourself, um, and that it's not; it's about running. It's about climbing, both natural movement and basically a lot of things into one.

16

When asked what they wanted to gain from doing Parkour, participants the majority reported goals that were intrinsic versus those that were extrinsic (Figure 4D). Extrinsic goals included reaching higher band levels (similar to belts in Karate) or reaching high level competitions. Intrinsic goals were primarily focused around having fun, getting stronger or more skillful, and gaining confidence. Goals intersected with some potential life lessons the participants felt they had learned through Parkour, including confidence, and hard work (Figure 4E).

> Um, I don't think I'm really in it to gain anything. I mean, I'd love to learn how to do cool tricks. But as long as I'm having fun and like learning new skills and hanging out with people that I would have never met, otherwise, I think I'm okay with it.

Competence

Transferable Skills

A third of participants enjoyed that the skills they had learned in Parkour class could be done elsewhere. Variations of this idea emerged when asked what they enjoy about Parkour (Figure 4B) and what is unique to Parkour (Figure 4C). Three participants focused their responses on the idea that Parkour was more accessible without the need for equipment or a specific set-up, so it was easier for them to practice.

> Um, I like it because there's so many different, like, you could do it anywhere like with baseball, I mean yes you could do it almost anywhere. But you have to have the equipment. Parkour you have no equipment. Yes, like for baseball, you have to find a flat area. You need a bat, ball, and bases. But for Parkour, you need nothing really.

Consistent with this theme, nearly two-thirds of participants said that they practice Parkour outside of the gym, primarily in places away from home (Figure 4E).

Unique Type of Movement

Nearly all participants mentioned Parkour movements as specifically unique, and their descriptions of it imply a sense of utility and capability. When asked generally what lessons they learned rather than answer with a concept (i.e. perseverance), about half of participants replied with a skill they had learned. Specifically, skills that make them feel capable in the real world, including the ability to fall without getting hurt or the confidence to overcome both literal and figurative obstacles (Figure 4F). When asked about feeling pressured in Parkour, self-imposed pressure was a major theme, with students acknowledging Parkour as challenging and them having to push themselves to overcome boundaries (Figure 4G).

> Yeah, actually. I feel like the will I guess, I, this feels sounds weird, but the believing in yourself, that you can do things or like anything, because in Parkour, for that, you would usually use it for like jumps or, or flips or anything like that, but in the real world, believing in your self would really come in handy.

Relatedness

Family and Friend Perspectives

As depicted in Figure 4H, perspectives from friends and family members generally fell into three groups, although three participants reported feeling that they try not to let others' perspectives have an influence, and that those perspectives are not important. The majority of family and friends thought that Parkour was cool or were very encouraging or supportive of them

18

being involved as shown. Despite participants generally feeling that their choice to do Parkour was supported, numerous said that their family or friends thought it was dangerous.

> Half the time you kind of afraid of me like jumping off stuff. But the other times it's they're super enthusiastic about it. People are like, well it's super cool. Can you do this? Can you do that? So usually are people are super supportive about it.

Sense of Comradery

This was by far the strongest theme across all of the interviews and throughout all of the questions. Participants discussed teamwork and social factors in every question. Notably when discussing their perspectives on competition (Figure 4I), of those who enjoyed competition, nearly half cited their main reason being the socialization and social gathering type of competition that Parkour offers. Positive team dynamics related to non-aggression and feeling collaborative with their friends were also a unique feature to Parkour that the participants found important.

The supportive atmosphere was one of the major themes of what they like about Parkour, and a few even reported enjoying pressure to do Parkour from their friends, describing it as motivating. Socializing was a driving force behind why the students had fun and felt that the learning environment for Parkour was unique.

> A lot of like, the like friendships that I made, like I have a ton of friends that I met at the parkour gym. And also, I just like getting better and learning new moves. It's just, I don't know. I like hanging out with my friends that I met there. And then I also just like improving with them and around them, it's cool and I enjoy it.

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I would also like to acknowledge Samantha Hurst, without her expertise in qualitative methods, this thesis would not have been possible.

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Discussion

Our research relied on a small sample size and was exploratory in nature; therefore, statistical significance was not a major concern. However, two subscales from the IMI and three from the PACE + had significant differences between the two groups, and their outcomes can be explained using the results from the qualitative interviews. Through the mixed method analyses, we found a promising relationship between Parkour and motivation, as defined by Self-Determination Theory (SDT), that illustrates the potential usefulness and pitfalls for improving physical activity for this age group. Our research has provided the first look into Parkour from the lens of SDT and sets the stage for further research into how Parkour could be a tool for increasing physical activity engagement.

Interpretation of Findings

Lower "Competence" was reported in the Parkour group compared to the non-Parkour group. This means that the children who do Parkour may not feel as good at it as those who do other sports. Potential justification for this finding is that the smaller self-selected non-Parkour sample likely comprised only children who enjoyed their sport enough to fill out a survey about it, whereas the Parkour sample was larger, providing a greater spread. Alternatively, Parkour may feel more difficult due to abstract goals that are not associated with winning. When discussing their goals for Parkour, over two thirds of the participants reported intrinsic goals related to fun and simply "getting better" (Figure 4D). The absence of rigid goals in Parkour (i.e. winning a game) may make it more challenging for children to feel competent in their skills. Other responses indicate that about half of participants felt that they had learned practical skills or confidence, suggesting a certain level of competence (Figure 4F).

21

Parkour participants also scored higher on the "Pressure" scale compared to the non-Parkour group. This finding was less surprising, given that Parkour involves more fear-based learning than most traditional sports. The IMI's questions related to Pressure focus on feelings of tension, but do not differentiate by source of pressure. Based on the participant interviews, it was nearly unanimous that the pressure was not construed negatively (Figure 4G). Participants reported feeling encouraged by their friends and their coaches and feeling pressured by themselves to accomplish challenges.

Parkour participants were lower in both their "Physical Activity Stage", and "Physical Activity Change Strategies" than the non-Parkour participants. Parkour children may have lower physical activity strategies because they are not actively thinking about physical activity as much. Nearly a third of participants explicitly mentioned that they enjoyed being active as reasoning for enjoying Parkour, but fun was a much bigger motivation. Parkour participants simply may not be as concerned about being physically active or motivated by the same factors of children who do traditional sports. These results suggest that Parkour participants are not interested in physical activity but are enjoying being active through Parkour. This suggests that Parkour could be a good way to engage children in physical activity who are not otherwise uninterested, yet further research is needed to explore this idea in depth.

Quantitative and qualitative results diverged on the metric of "Peer Support", where the survey results suggest that Parkour students have less friend support than their non-Parkour counterparts. Interview responses overwhelmingly suggested positive friend and social environments in Parkour. Participants felt that their relationships with their friends/training partners were among the main reasons for enjoyment, along with simply finding Parkour to be fun. Potential reasons for the divergence here could be the interpretation of their friends outside

of Parkour versus relationships in the Parkour setting. PACE + explicitly mentions this support for physical activity/exercise, yet some participants may not think of Parkour as exercise, as suggested by the lower PA stages of change and change strategies.

Despite no trending or significant results related to autonomy from the quantitative data, the qualitative data illustrated strong themes of autonomy. Children identified the freedom and creativity of Parkour as some of their favorite aspects, while explicitly stating that they felt it was their choice not only to do Parkour, but what to do while they were participating. Overall, the qualitative results suggest that Parkour is a very positive experience for the participants, and future research into the stronger emergent themes of autonomy, competence and relatedness are warranted.

Our findings are consistent with the existing research around Parkour, that thus far have indicated positive aspects of participation and health identities.[23,24] Previous qualitative research exploring the use of Parkour in a school setting resulted in five themes (enjoyment, fear, problem-solving skills, social skills, and inclusion), many of which were echoed in our interview responses.[25] One of this study's strengths over prior research is the rigor and adoption of established qualitative methodology. Additionally, this research was fit into the framework of a tried and tested psychological theory.

Our research included a male-dominated sample (N = 32; 84.2%), which was not the case in the previous studies. The aforementioned studies all took place in school settings, whereas this research was conducted in a commercial gym. The small female sample may be indicative of gender representation in Parkour, with one study suggesting female representation in the sport may be around 12%.[46] Further research is needed to explore if Parkour is as inclusionary as stated in prior studies.[25]

Limitations

This study was not without limitations, first and foremost being the small sample size with a large age range that was recruited from a single site. The 27 Parkour participants make up about a quarter of all members of the facility within the set age range. Limited resources only allowed for non-random convenience sampling, which may have resulted in a biased sample. The sample size of the comparison group was also limited by the timing of the COVID 19 pandemic. Non-parametric tests were used to compensate for the small sample.

The IMI's questions were unable to capture the intricacies of motivation in Parkour and may account for the discrepancies between the quantitative and qualitative results. "Pressure" was emblematic of this issue in that it was not sensitive enough on the IMI to differentiate between internal pressure (as expressed through the interviews) and external pressures.

The qualitative study sample was also small, although it was a reasonable portion of the original sample for an explanatory sequential design. The use of a third-party interviewer who was not associated with Parkour helped to minimize response bias, especially given the PI's involvement in the sport.

Strengths

Despite limitations, this study is novel for the use of mixed methods to examine motivation in Parkour, which allowed for a deeper exploration of themes that single method analyses could not. The strong basis in SDT provided a reliable framework to explore the primary questions, and the use of rigorous methodology supports the validity of the findings. This study illustrates the potential of Parkour as a physical activity choice for youth and provides a starting point for future research to explore the sport more in depth.

Particularly, the results related to physical activity state of change and change strategies from the PACE + suggest that kids who participate in Parkour may not be attracted to other forms of activity. The use of qualitative methods further explains this phenomenon, with participant responses highlighting the distinct features of Parkour that make them enjoy it over other sports. The findings related to competence and pressure show potential gaps in Parkour that should be explored more in depth to better understand how these impact participation and enjoyment. The qualitative findings resulted in a number of emergent themes related to accessibility, sense of comradery, and a supportive learning environment which could be explored in depth. Ultimately these findings give initial support for future research to explore Parkour as a good way to get kids interested in physical activity.

Conclusions

Future research should approach the question here with a larger sample size and more diverse source for the sample, such as multiple gyms throughout a given region. Exploration into differences of how Parkour is perceived based on gender could prove useful in determining its potential impacts on gender disparities in physical activity. Including an objective measure of moderate-to-vigorous physical activity (MVPA) would help fill in the gap related to the physical benefits of Parkour participation. Exploring the differences between Parkour practitioners who use a gym versus those who primarily use the outdoors may be useful for understanding how the sport may breakdown typical barriers to physical activity, such as lack of equipment or a proper space, as the interview responses suggest.

The mixed results related to SDT constructs illustrates suggest potential for Parkour as a physical activity choice for youth, but more research into Parkour and potential theories that may better assess Parkour's potential value. Given the importance of physical activity for lifelong health, it is important to identify activities that keep children engaged, and to understand the motivations that drive those choices. We should strive to find activities that not only make them active now but will promote a physically active lifestyle for the rest of their lives.

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Appendix 1: Interview Guide

- **Ice-breaker questions**: *The intent of this section is to encourage participants to talk freely about their personal experience with physical activity in a more open-ended, non-threatening manner.*
  - What are your favorite ways to be physically active?
    - Define Physical Activity as "The ways that you like to exercise or move around, this includes walking, biking, playing, etc."
    - How does being active make you feel?
    - Where do you practice Parkour or other activities?
      - If they don't practice outside, ask them why they feel it is hard to do that.

- **Autonomy and Perceptions**: *The intent of this section is to understand participants reasoning for participating in Parkour, and their perceptions of their autonomy in that choice and their other physical activity choices.*
  - How did you first get involved with Parkour?
    - If no name of a person is given, probe for how they first heard about it
  - What kinds of things make you excited to come to Parkour classes?
    - If they say that they aren't excited, probe for why
    - What kinds of things make you not want to come to class?
    - If positive, ask what other ways they practice Parkour outside of classes.
  - Have you ever felt pressured or pushed by anyone to practice Parkour? Can you tell me more about that?
    - Maybe your parents, your friends, or even yourself?
  - Generally speaking, what do friends or family think about you doing Parkour?
    - How do their opinions impact your physical activity choices?
  - What do you specifically like about Parkour compared to other activities?

- **Goals and Motivations**: *The intent of this section is to understand what the participants want to get out of Parkour, and how they view its role in their future.*
  - What do you want to get out of Parkour?
    - How long are you planning on doing Parkour?
  - What have you learned from Parkour that you can apply to life in general?
    - If they need priming; "How does Discipline play into this? Motivation? Teamwork?"

- **Competition**: *The intent of this section is to understand how participants relate to competition and how that impacts the physical activities they choose to engage in.*
  - How do you feel about competition in sports or activities other than Parkour?
    - Competing with friends? Competing with new people?

Appendix 2: Quantitative Tables and Figures

Table 1: Demographics

Table 1: Demographics	Mean Age	Male	Female	Totals
Parkour	11.7	25 (92.59%)	2 (7.41%)	27 (71.05%)
Non-Parkour	12.18	7 (63.63%)	4 (36.37%)	11 (28.95%)
Total	11.39	32 (84.2%)	6 (15.8%)	

Table 2: IMI Mann Whitney U-Test

Table 2: IMI Mann Whitney U-Test	Parkour		Non-Parkour		P-Value
	Mean Rank	N	Mean Rank	N	
Interest/Enjoyment	17.61	23	17.27	11	0.942
Competence	17.15	27	25.27	11	0.041
Choice	17.98	27	21.75	10	0.353
Pressure	22.56	27	12	11	0.007

Table 3: PACE+ Mann Whitney U-Test

Table 3: PACE+ Mann Whitney U-Test	Parkour		Non-Parkour		P-Value
	Mean Rank	N	Mean Rank	N	
Stage of Change	16.98	27	25.68	11	0.027
Change Strategies	16.46	27	25.85	10	0.017
Pros	18.9	26	19.23	11	0.935
Cons	20.34	25	14.32	11	0.115
Self Efficacy	17.83	26	21.77	11	0.316
Family Influences	18.57	27	21.77	11	0.427
Peer Influences	16.93	27	25.82	11	0.025
Environmental Factors	17.96	27	23.27	11	0.19

Table 4: IMI Visit Correlations

Table 4: IMI Visit Correlations	Visit Number		Months Enrolled	
	Pearson	P-Value	Pearson	P-Value
Interest/Enjoyment	-0.195	0.398	0.014	0.951
Competence	-0.11	0.601	-0.005	0.98
Choice	-0.125	0.552	-0.077	0.713
Pressure	0.015	0.942	0.278	0.179

Table 5: PACE+ Visit Correlations

Table 5: PACE+ Visit Correlations	Visit Number		Months Enrolled	
	Pearson	P-Value	Pearson	P-Value
Stage of Change	0.035	0.867	-0.016	0.939
Change Strategies	-0.071	0.734	-0.15	0.474
Pros	-0.202	0.344	0.124	0.562
Cons	-0.124	0.574	0.252	0.247
Self Efficacy	-0.203	0.341	-0.237	0.264
Family Influences	-0.164	0.433	-0.104	0.621
Peer Influences	-0.167	0.426	-0.147	0.482
Environmental Factors	-0.033	0.876	-0.058	0.785

Graph 2A: IMI Interest/Enjoyment by Sport
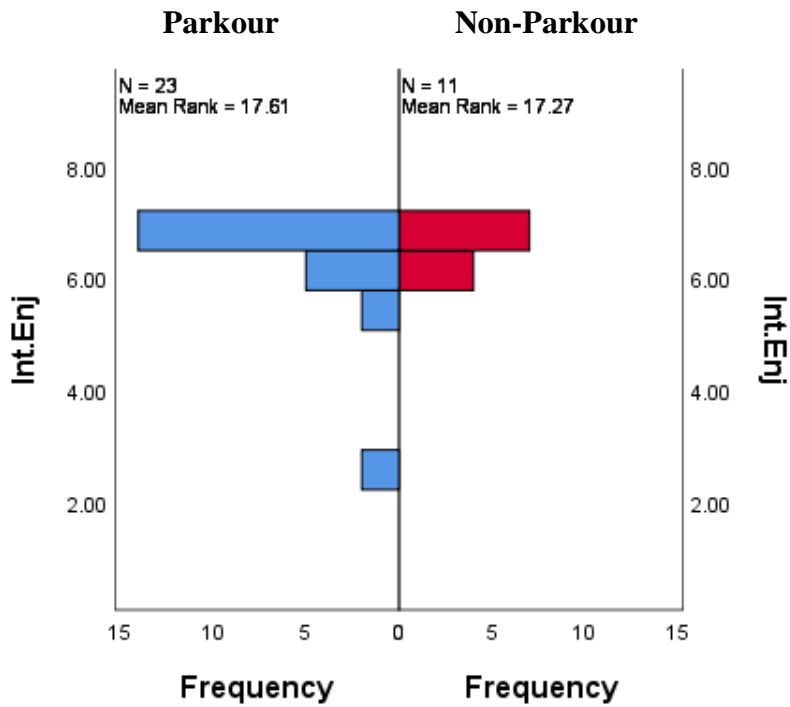
Graph 2B: IMI Competence by Sport

Parkour **Non-Parkour**
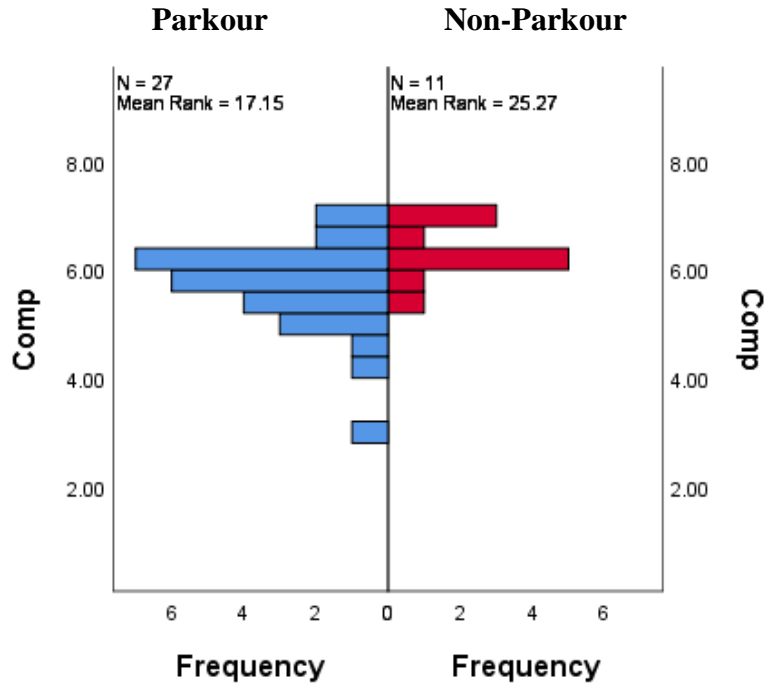
Graph 2C: IMI Choice by Sport

Parkour **Non-Parkour**
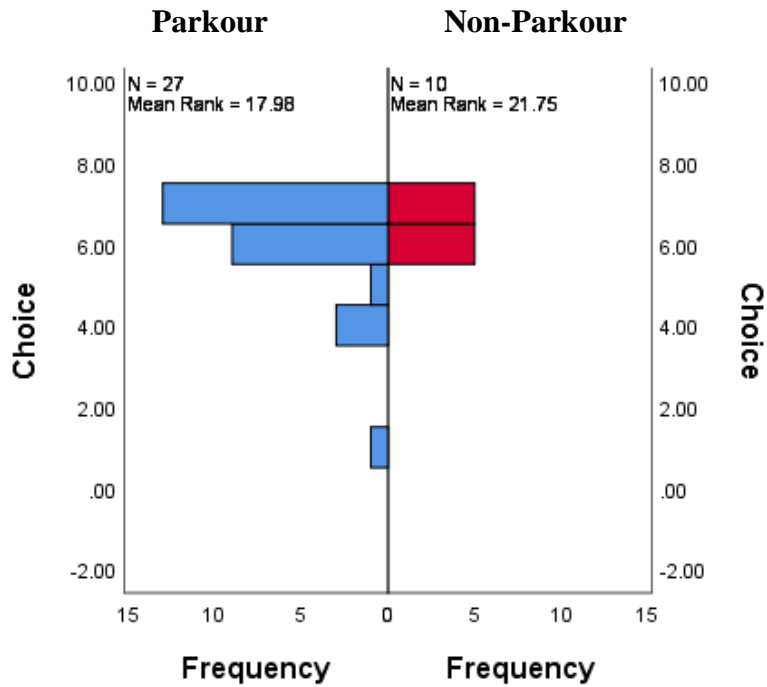
Graph 2D: IMI Pressure by Sport

Parkour   **Non-Parkour**

N = 27
Mean Rank = 22.56

N = 11
Mean Rank = 12.00
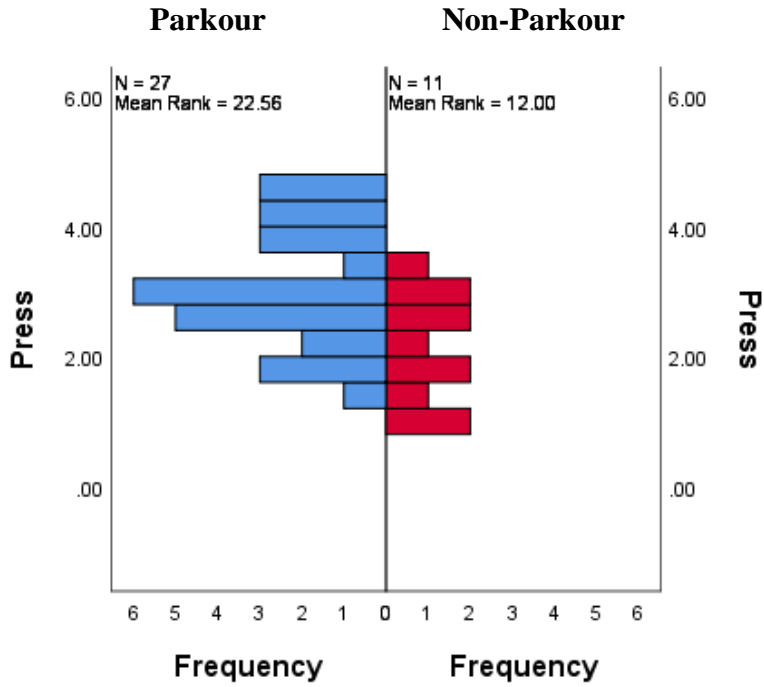
Graph 3A: PACE+ Stage of Change by Sport

Parkour   **Non-Parkour**

N = 27
Mean Rank = 16.98

N = 11
Mean Rank = 25.68
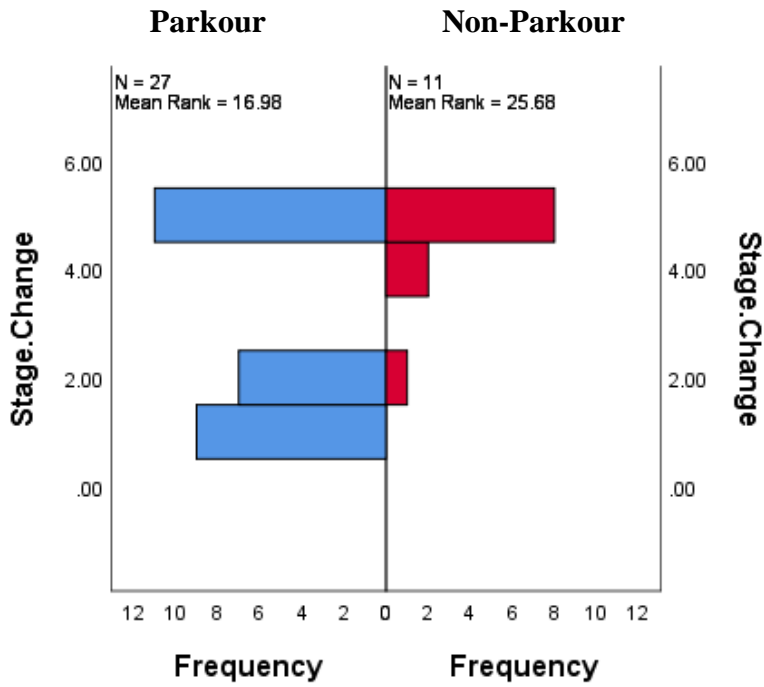
Graph 3B: PACE+ Change Strategies by Sport

Parkour **Non-Parkour**
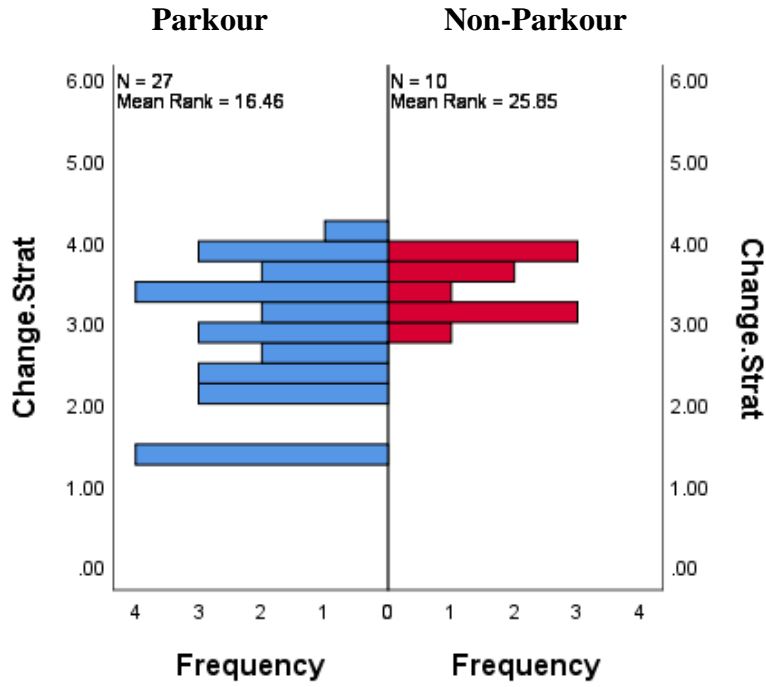
Graph 3C: PACE+ Pros by Sport

Parkour **Non-Parkour**
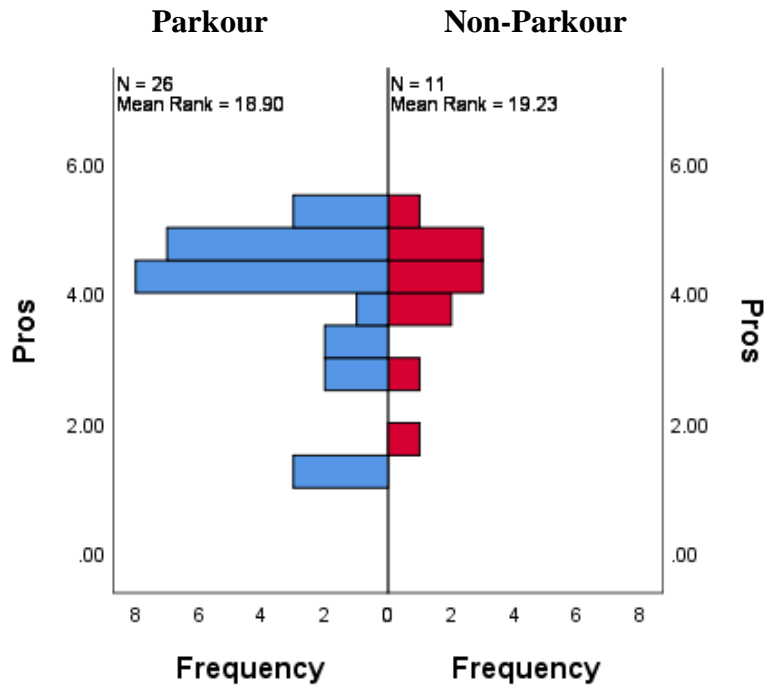
Graph 3D: PACE+ Cons by Sport

Parkour **Non-Parkour**

N = 25
Mean Rank = 20.34

N = 11
Mean Rank = 14.32

Cons

Cons

Frequency   Frequency
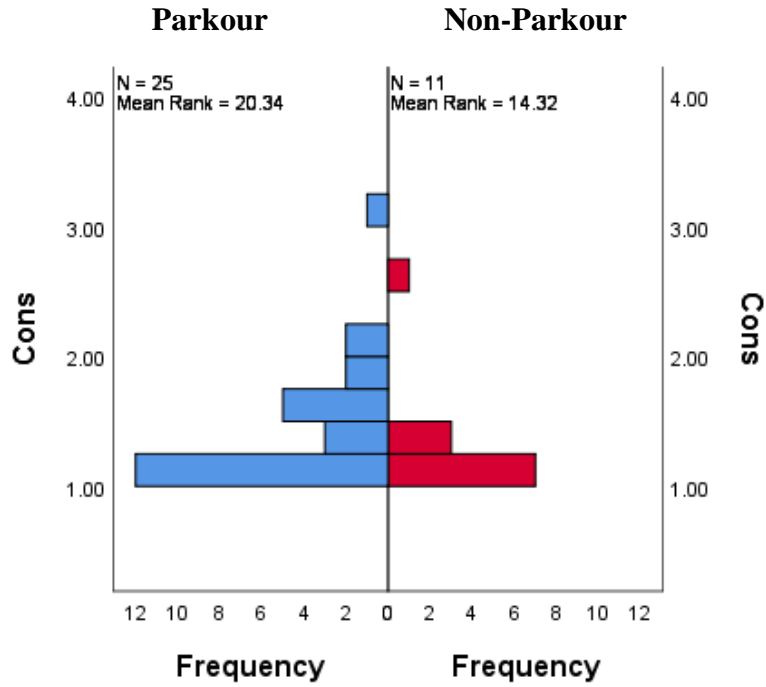
Graph 3E: PACE+ Self-Efficacy by Sport

Parkour **Non-Parkour**

N = 26
Mean Rank = 17.83

N = 11
Mean Rank = 21.77

Self.Eff

Self.Eff

Frequency   Frequency
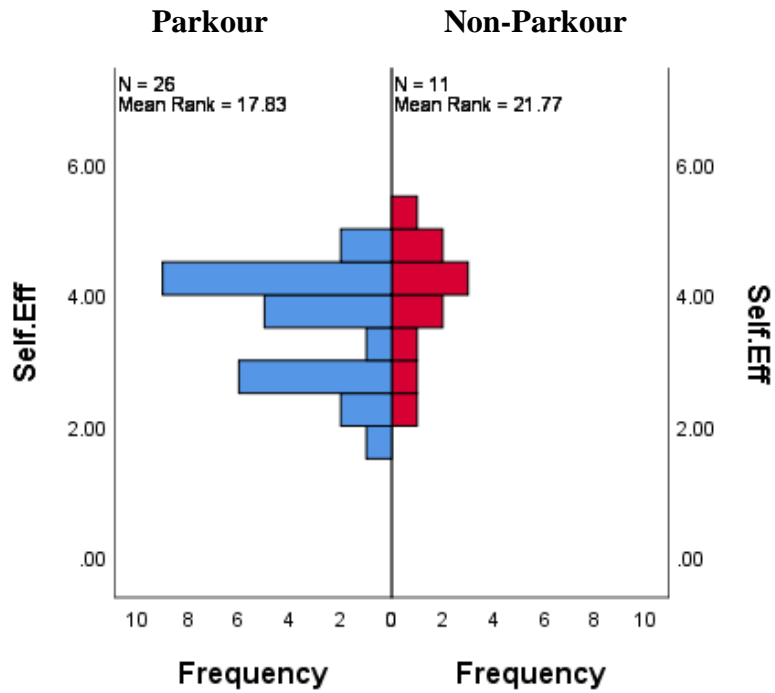
Graph 3F: PACE+ Family Influences by Sport

Parkour   **Non-Parkour**
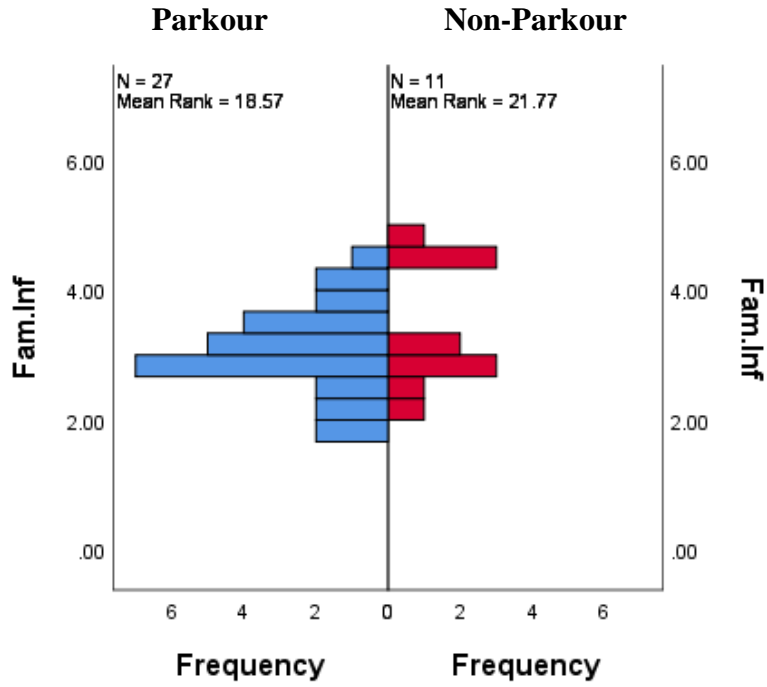
Graph 3G: PACE+ Peer Influences by Sport

Parkour   **Non-Parkour**
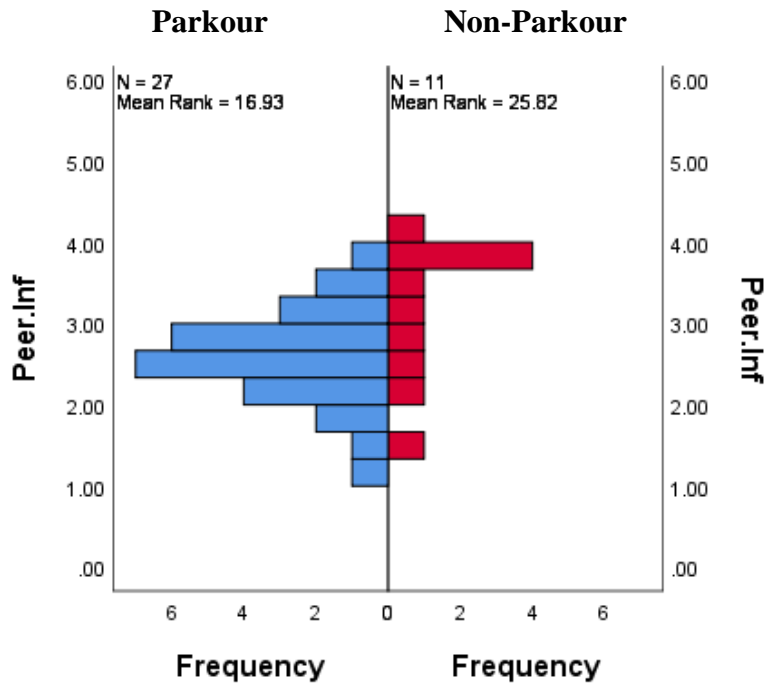
Graph 3H: PACE+ Environmental Factors by Sport

Parkour   **Non-Parkour**
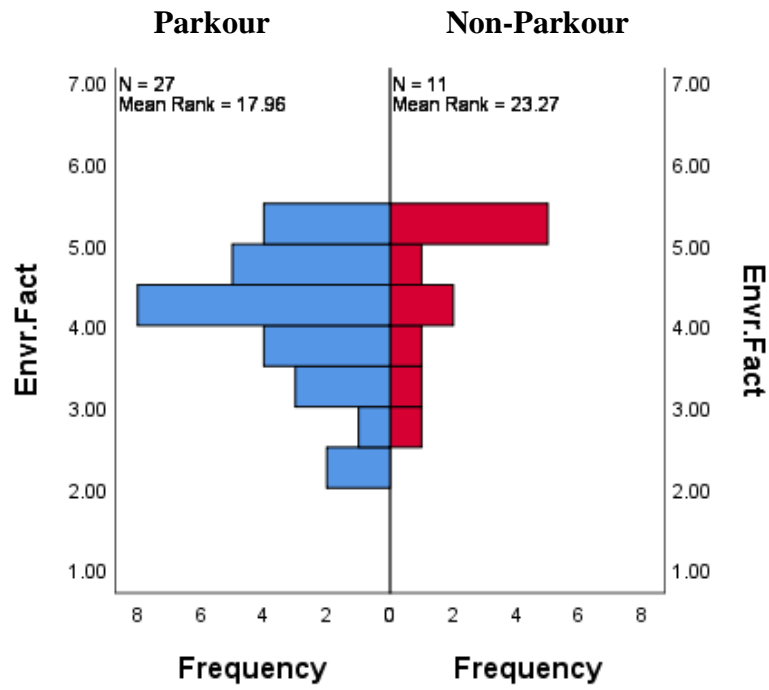
Appendix 3: Qualitative Figures
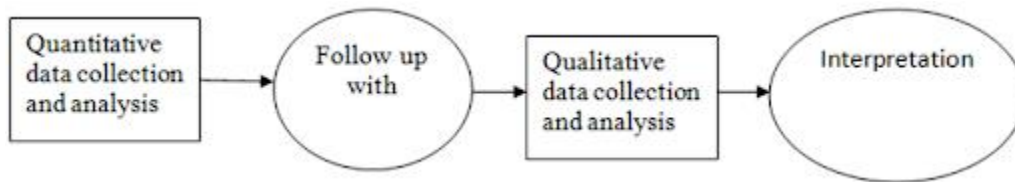
Figure 1: Explanatory Sequential Design[47]
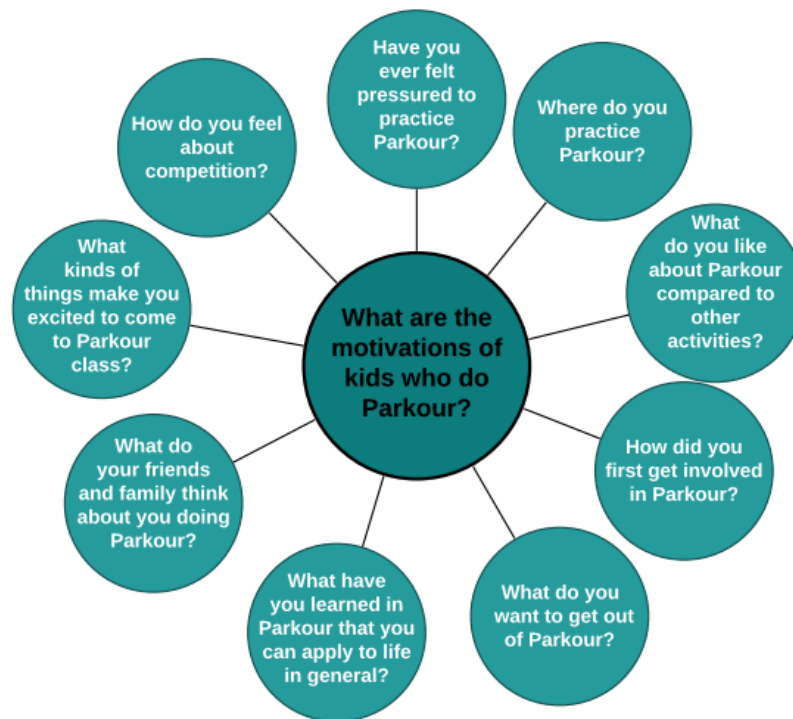
Figure 4: Primary Questions
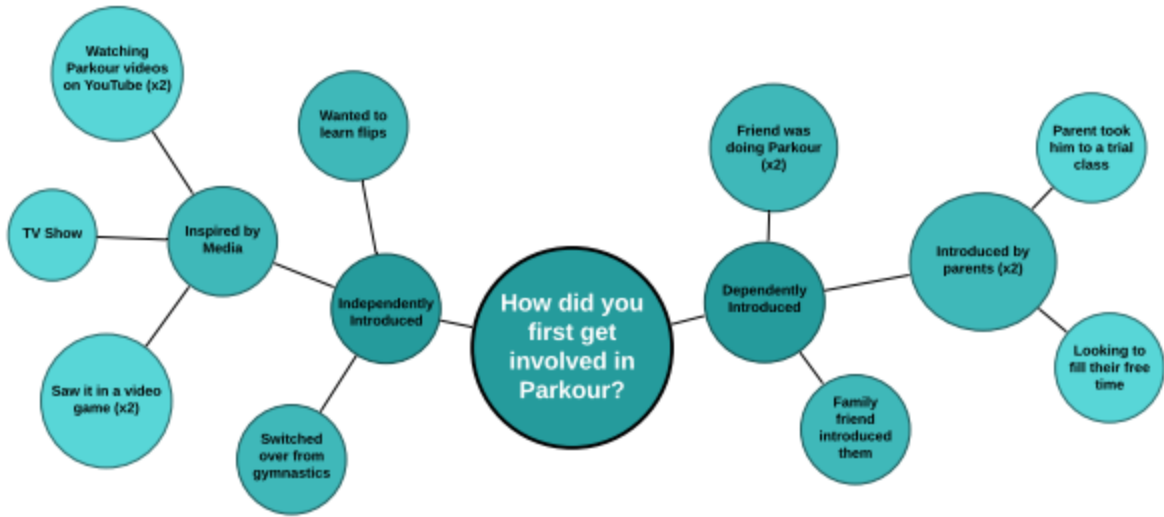
Figure 4A: Initial Involvement in Parkour
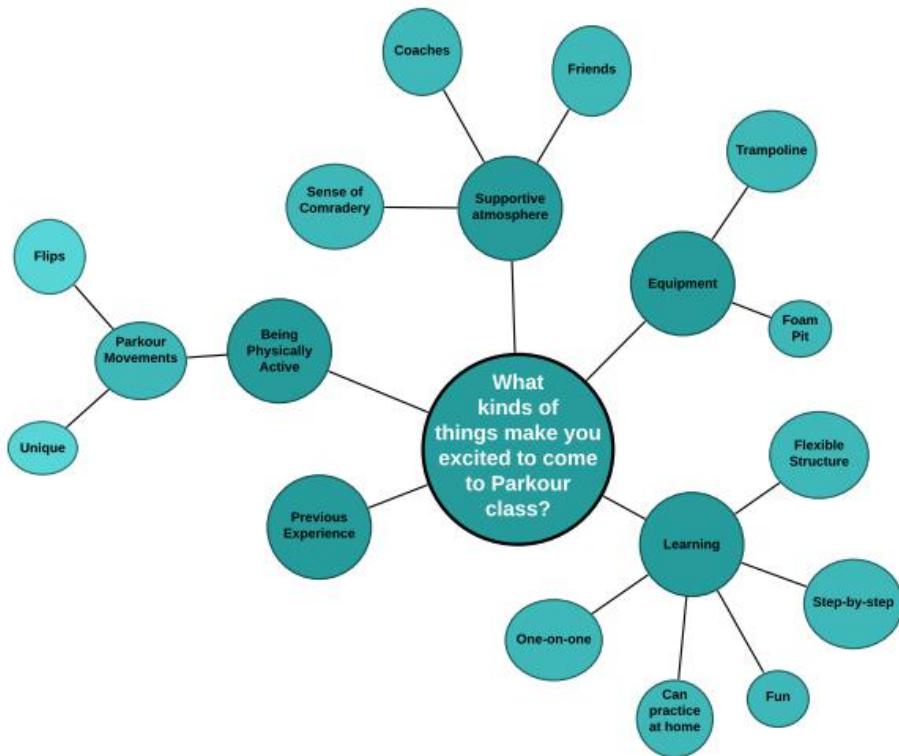
Figure 4B: Things they enjoy about Parkour
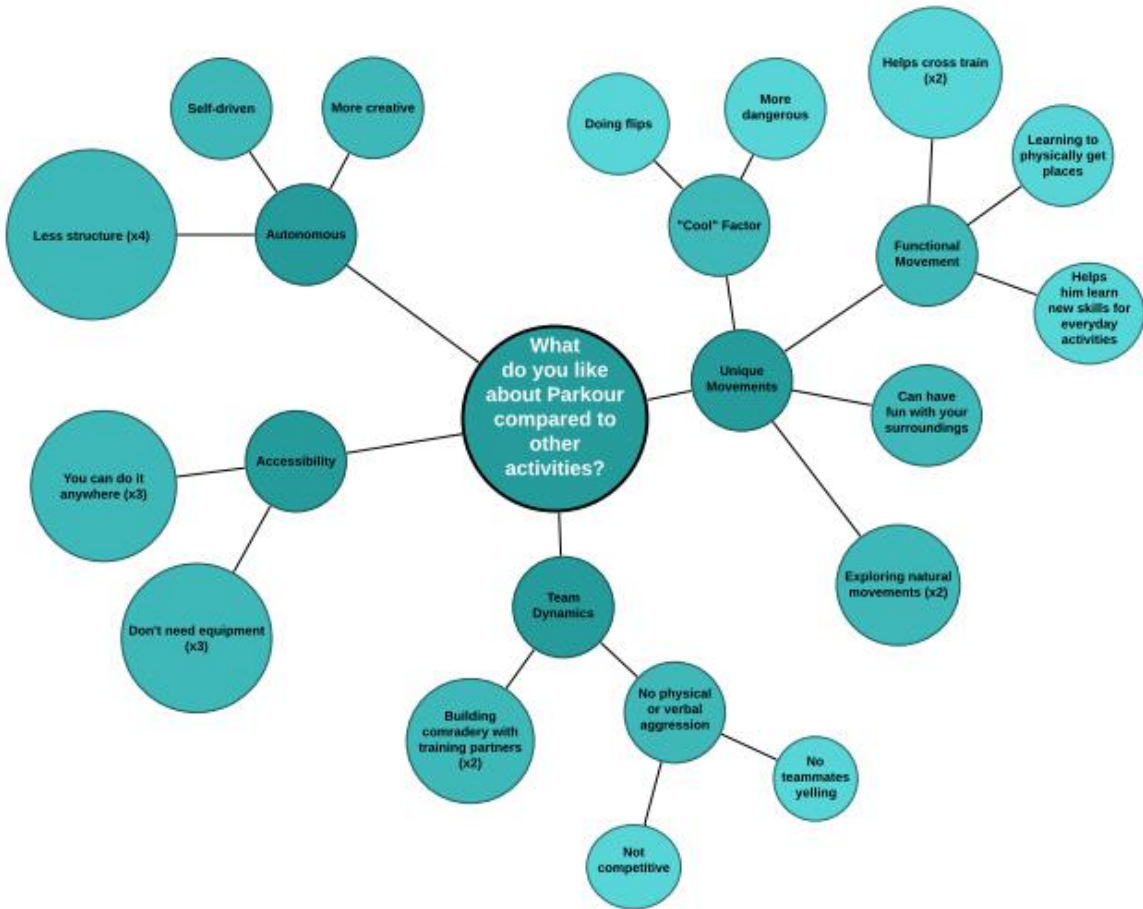
Figure 4C: How Parkour differs from other sports
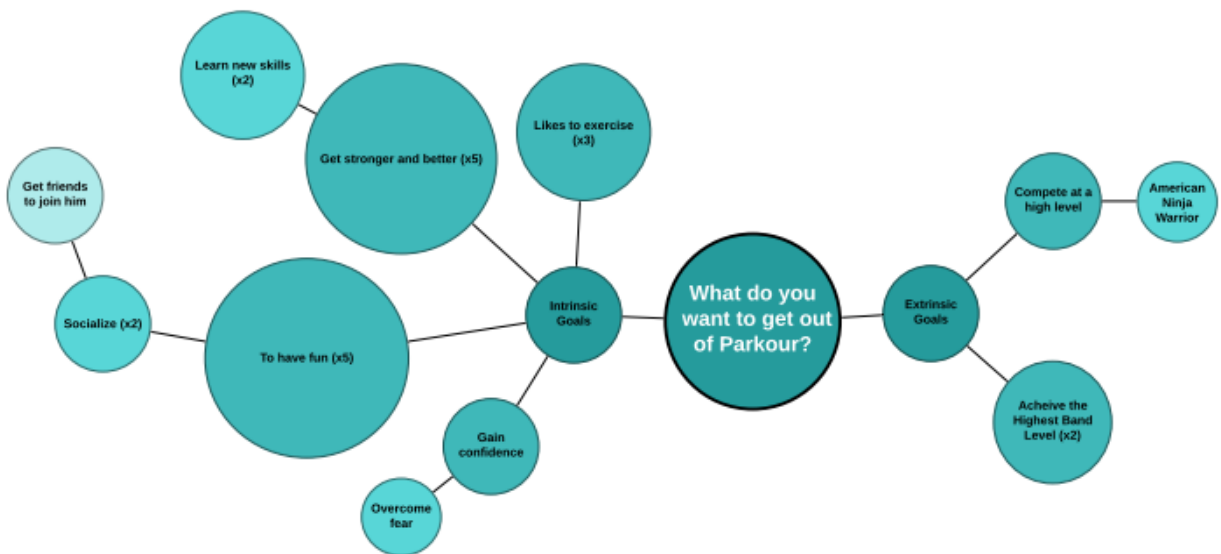
Figure 4D: Goals for Parkour
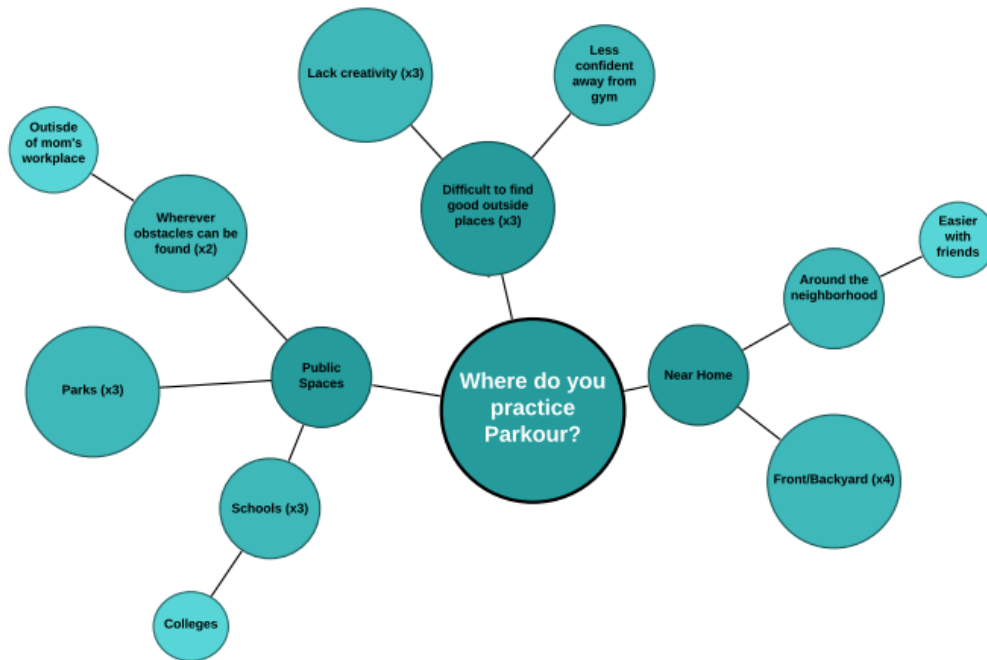
Figure 4E: Where they practice Parkour
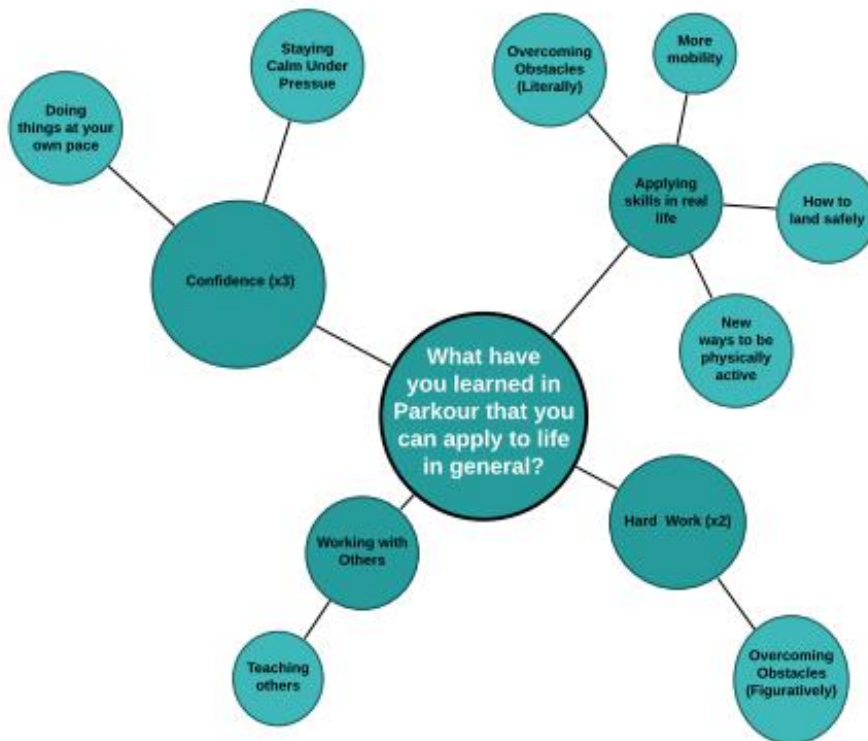
Figure 4F: General lessons from Parkour
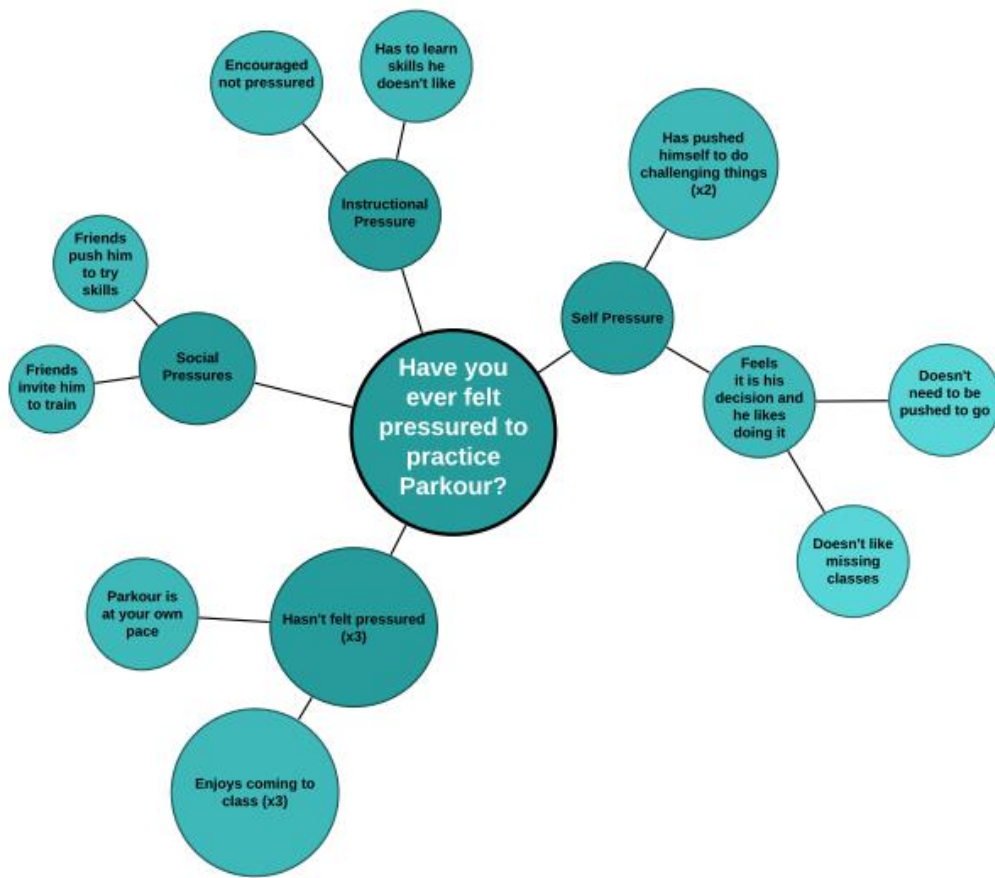
Figure 4G: Pressure in Parkour
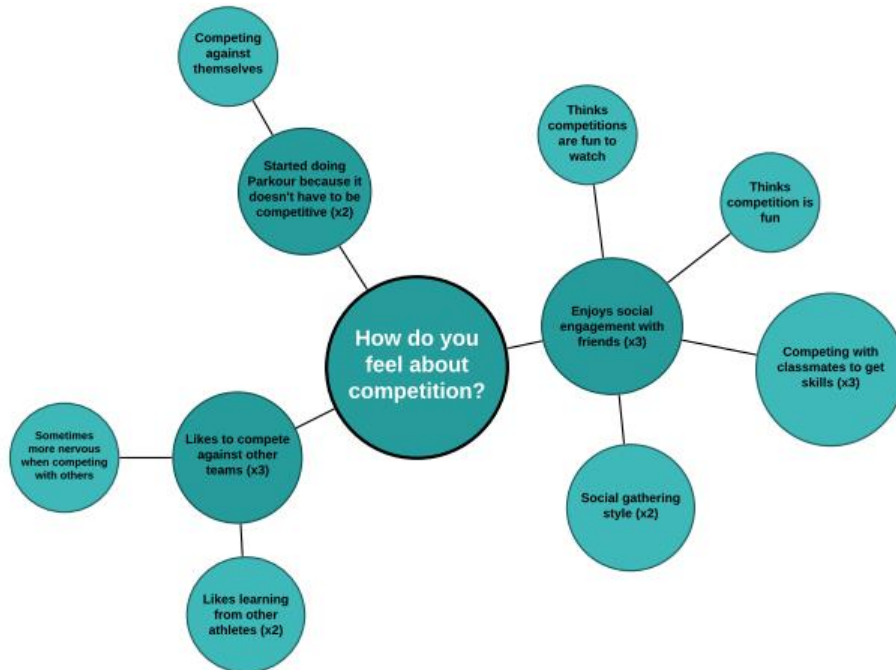
Figure 4H: Family and Friend Perspectives on Parkour

Figure 4I: Perspectives on competition