Differences in Adaptive Outcomes between Previous Physical Education and a Teaching Games for Understanding Games Unit in Adolescent Girls

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Abstract

Two weeks into a new academic school year, a physical education (PE) class of 25 grade nine girls completed a survey relative to their previous PE experiences. Following the completion of a six-lesson territorial games unit using the six-step teaching game for understanding (TGfU) model taught by a guest certified female teacher with TGfU expertise, the sample completed the same survey except applying to the TGfU-games unit. The study investigated differences in self-reported likes, dislikes, self-efficacy, value, ability conceptions, physical activity, anxiety, and need for cognition between previous PE experiences and a TGfU games unit. Both the PE-experience and TGfU-unit surveys consisted of 39 items (34 Likert style, two open-ended, and three demographics). One-way repeated measures ANOVA was used to assess differences in these constructs between previous PE and the TGfU-games unit and Creswell's protocol was applied to analyze data from the two qualitative survey items (students' likes and dislikes of PE and TGfU). Results revealed both likes and dislikes for TGfU and PE with significantly higher self-efficacy and lower anxiety, value, and entity ability conception in the TGfU-games unit. The study provides new insight potential differences between previous experiences in PE and a TGfU-unit on students' motivation and the need for cognition in PE.

Keywords: TGfU, ability conceptions, self-efficacy, value, gender

Introduction

Research has revealed that girls' motivation and enrolment in physical education (PE) tends to decrease in adolescence (e.g., CDC, 2015; Ennis, 2000; Lodewyk, Gammage, & Sullivan, 2009; Luke & Sinclair, 1991) and this coincides with reduced overall levels of physical activity and participation in sport (Dishman et al., 2005). Among the many factors in this is the perception among too many adolescent girls that the content of PE is boring, irrelevant, and too focused on traditional sports that are taught using rather controlling (direct and teacher-centered) methods (Baron &

Downey, 2007; Ennis, 2000; Singleton, 2009). Teaching Games for Understanding (TGfU) is an instructional model designed to be more learner-centered by having teachers facilitate active, holistic, and socially-situated engagement of students according to their personal readiness, interests, and input (Azzarito & Ennis, 2003; Storey & Butler, 2010). Although there is some research support for many of the theorized aims of this model (e.g., Harvey & Jarrett, 2014; Zhu, Ennis, & Chen, 2011), calls have been made for more empirical research into whether TGfU might enhance favourable outcomes such as student motivation, particularly among more vulnerable groups such as adolescent girls (Harvey & Jarrett, 2014; Hopper, 2002). This study, therefore, investigated grade nine girls' self-reported likes, dislikes, self-efficacy, value, ability conceptions (incremental or entity), physical activity, anxiety, and need for cognition relative to previous PE experiences and a TGfU-taught territorial games unit in PE.

Metzler (2011) explains that, compared to a more direct or traditional instructional model stemming from more of a behaviourist (conditioning) learning theory, TGfU is grounded in constructivist learning theory emphasizing students' active and interactive engagement in the learning process. Mandigo, Butler and Hopper (2007) add that a primary aim of TGfU is to foster student success, choice, knowledge, technical and tactical skills, decision-making for a wide variety of games for improved lifelong active living. To do so, students engage in various modified games (e.g., 4 versus 4 three touch soccer in a small area and requiring a controlled dribble across the goal line to score) that have some similarities to the larger game or sport (e.g., 11 versus 11 regulation soccer). These games typically resemble other games within a certain game category (net-wall, territorial, striking-fielding, or target games), require students to cooperatively problem-solve and adapt the games to suit their goals and needs (e.g., level of challenge). An underlying premise is that students who are engaged cognitively in the necessity and importance of certain tactics and skills in the games will then be more motivated to improve those so they can improve their game performance.

For such reasons, TGfU lessons generally begin with an engaging, modified, small-sided game that tends to emphasize a particular tactical problem; and then, proceeds into a short "game appreciation" phase wherein students are prompted to reflect on aspects of the initial game (e.g., similarities in the rules, skills, and strategies of the game and other games) and what it took to perform successfully in that game. These two initial steps help to provide students with the context and rationale for subsequent learning while enabling teachers to assess how much requisite skill and knowledge students have for the remaining phases of the lesson (tactical awareness, appropriate decision-making, skill development, game performance). In the tactical awareness step, students often work in small groups to understand specific tactics (e.g., offensive, defensive, on-the-ball, and off-the ball) and why they are needed for optimal game performance. Students then

physically engage in more small-sided modified games that are tailored to their needs and that provide opportunities to apply those tactics. Whereas traditional instruction tends to begin with skill development (Metzler, 2011), focused skill development tends to occur next (fourth in a six-phase TGfU) wherein students learn and practice a few necessary game skills. Finally, the lesson ends with application of all learning in a less modified game (more resembling the actual formal game) than earlier games in the lesson. Some academics and practitioners have successfully reduced the six phases of the model to three or four; namely, modified game, tactical development (often in the form of teacher-led question and answer), skill development, and modified game-performance followed by closure (Harvey & Jarrett, 2014; Mitchell, Oslin, & Griffin, 2013).

Although research evidence for TGfU has increased (e.g., Butler, 2006; Kinchin & O'Sullivan, 2003; Turner & Martinek, 1999; Zhu et al., 2011), more authentic research is needed to better balance the theoretical and empirical justification for TGfU especially for how TGfU impacts motivation in more vulnerable groups such as adolescent girls in PE (Harvey & Jarrett, 2014). Such investigations are also useful because PE curricula tend to emphasize games more than other movement forms, inadequately integrating games like softball with similarly structured games (e.g., striking-fielding) such as cricket or rounders, and underemphasizing the meaningfulness of the game in real life (e.g., role in personal fitness and well-being) (Cothran & Ennis, 1999; Ennis, 2000). Research has also revealed that significant proportions of high school PE students desire more time playing games than performing drills that are largely isolated from any broader thought, rationale, or meaning (Rikard & Banville, 2006; Storey & Butler, 2010).

To provide new insight into whether TGfU might facilitate adaptive outcomes among girls in high school PE, the aim of this study was to assess if there would be significant differences between regular PE and a TGfU-games unit in grade nine girls' self-reported enjoyment (likes and dislikes), self-efficacy, value, ability conceptions, physical activity, anxiety, and need for cognition. Social cognitive theory (Bandura, 1986) serves as the theoretical framework for the study, primarily its assertion that learners self-regulate their learning, achievement, and behaviour interactively between personal (e.g., anxiety, values, ability conceptions, self-efficacy, and need for cognition) and social and environmental factors. Pintrich, Smith, Garcia, and McKeachie (1991) define self-efficacy as a level of confidence to succeed in something; value as one's level of interest, importance, and use for something; and, anxiety as the degree of feeling unease and persistent stress in a certain situation. Biddle, Wang, Chatzisarantis, and Spray (2003) explain that ability conceptions are either more incremental (viewing ability more as a outcome of learning that can improve with effort) or as more of an entity (relatively innate or a natural gift that cannot be altered much even with effort). Finally, individuals with higher levels of the need for cognition relative to something tend to enjoy solving the cognitive challenges (i.e., reasoning, critical-thinking, and problem-solving) associated with it (Kardash & Scholes, 1996).

There is research evidence for the importance of each of these constructs in PE (e.g., Lodewyk & Gao, 2010; Lodewyk et al., 2009; Ommundsen, 2003) yet relatively little is known about

them in TGfU compared to regular PE. For example, self-efficacy has been a consistent predictor of important outcomes such as motivation, participation, and performance in PE and other physical activity settings (Smith & St. Pierre, 2009). Although need for cognition has only received limited attention in PE (e.g., Lodewyk & Gao, 2010), research in other academic settings has linked it to favourable outcomes such as attentiveness, enjoyment, effort, and success on complex tasks (Nussbaum & Bendixen, 2003). In terms of ability conceptions in PE, students holding more of an entity than incremental conception of ability tend to be less motivated, strategic, achieving, and engaged on learning tasks (Biddle et al, 2003; Lodewyk, 2009; Ommundsen, 2003). Heightened anxiety often coincides with lower motivation, self efficacy, interest, and achievement (Pintrich et al., 2009) including in PE (Lodewyk, 2009; Ommundsen, 2004). Finally, value for PE (in the form of how interesting, important, and useful it perceived to be), has also been linked to many achievement-related outcomes in PE including self-efficacy and intention for future participation (Gao, Lodewyk, & Zhang, 2009). A 2010 Singaporean study by Fry, Tan, McNeill, and Wright investigated differences in value for a games concept (constructivist) approach compared to a more traditionally taught direct teaching approach to games in close to 300 primary school children in PE. Results revealed that "the children generally saw that the games concept approach had positive impact by adding value to their PE experiences, through processes and outcomes that were seen to be different from those of their prior PE. However, there were also negative indications in the findings and these highlighted deficiencies in the way that school teachers had used the approach" (p. 139). They cautioned that, although the more constructivist approach had some merit, enhanced student value for it depended on how well teachers implemented it; hence there is a need for appropriate teacher-training.

In response to the relative lack of knowledge about differences in ability conceptions, need for cognition, physical activity levels, and indices of motivation (i.e., self-efficacy, value, enjoyment, and lower anxiety) between a TGfU-unit and regular PE (especially relative to girls), there were two specific objectives for this study. First, would there be significant differences in anxiety, self-efficacy, value, the need for cognition, and entity and incremental ability conceptions between the TGfU-unit and previous PE experiences? Second, what would students like and dislike about the TGfU-unit compared to their previous experiences in regular (non-TGfU) PE?

Method

Participants and Procedures

Each of the students ($n = 25$) in a class of ninth-grade girl's PE at a small Catholic high school (grades 9-12) located in a semi-urban region of south-western Ontario (Canada) consented to participate in the study. Informed consent was also obtained from all necessary levels such as a university ethics board, school board, principal, teacher, and female student participants and their parent/guardians. The PE teachers at the school taught using mainly a direct style (Metzler, 2011) and followed the provincial health and PE curriculum (Ontario Ministry of Education, 2010); yet, as in most Canadian schools (Lu & Lodewyk, 2012) the program was mainly sports-based compared to other movement forms. Only

two students reported a disability (asthma and a sore knee) that limited their performance in PE.

The study began during the third week of a new academic school year and with a new PE teacher since grade nine is the first year of high school in Ontario. Each of the girls' in the class (*n* = 25) completed the initial survey requesting some demographic information (i.e., age, disability, and PE grade usually received) along with their self-reported likes, dislikes, and levels of self-efficacy, value, ability conceptions, physical activity, anxiety, and need for cognition relative to their previous PE experiences. The sample was then taught a territorial games unit using the six-step (modified small-sided game play, game appreciation, tactical awareness, appropriate decision-making, skill development, and game performance) progression and methodology synonymous with TGfU (e.g,, Mandigo et al., 2007). The unit was taught by a guest certified female teacher with current expertise and experience with TGfU. Shortly after the completion of the TGfU-unit, all except one student in the class (*n* = 24) completed a second survey with the same items as the earlier (first) survey except these survey items were specifically pertaining to the TGfU-unit rather than their previous PE experiences. Both the PE experiences and TGfU-unit survey were administered during students' 177 regular PE classes by another trained graduate student (not the guest instructor) and took approximately 10-12 minutes for students to complete.

The TGfU unit consisted of six lessons each lasting 60 minutes (the total duration of each class was 75 minutes) and was taught by a graduate student who was a licensed physical educator and had expertise in and experience using TGfU in PE. The focus of the unit was the learning of primary and transferable tactics and skills specifically for the invasion games of team handball (lessons 1 and 2), ultimate disc (lessons 3 and 4) and tjoukball (lessons 5 and 6) (see Table 1 for a list of activities within each lesson's six steps). A separate qualitative study went beyond the purpose of this study and more closely assessed six of the most disengaged girls in the class before, during, and after the TGfU unit. The fidelity of the TGfU-unit was ensured by having the unit developed by the authors, one of which was a professor with noted expertise in the teaching of games using TGfU.

Measures

Both the PE-experience and TGfU-unit surveys consisted of 39 items (34 Likert-style, two open ended, and three demographics). Some other items on the survey were not used because they were beyond the scope of this study. The PE experiences survey first asked students to report their birthdate, any disability they had, and the grade (%) they usually received in PE. This item for self-reported grades has been used in a variety of academic research settings including the classroom (e.g., Winne & Jamieson-Noel,

Table 1

TGfU Activities (and Emphases) by Steps

	Lesson Step 1: Game	Lesson Step 2: Game Appreciation	Lesson Step 3: Tactical Awareness	Lesson Step 4: Making Decisions	Lesson Step 5: Skill Execution	Lesson Step 6: Performance
Class 1: Team Handball	Gate Handball	Song	Discussion (Gaining position)	Zone Handball (Overhand or underhand shot/throw)	Four-Corner Handball (Shooting)	Handball
Class 2: Team Handball	Touchdown Handball	Question Sheet	Surf or Score (Creating space)	Trio Pass (Losing your defender and choosing the best area to move into)	3 versus 2 (Protecting the net and dribbling)	Handball
Class 3: Ultimate Disc	Circle In	Graffiti	Race the Clock (Find and pass to the open player)	Collapse (Passing to the most open player)	Disc Bowl (Passing to progress and to score)	Ultimate
Class 4: Ultimate Disc	Hoopster	Match Game	Frisbee Basketball (Taking the open scoring opportunity; stationary carrying skills)	Partner Challenge (Throwing under or over the defender)	Partner Relay (Catching)	Ultimate
Class 5: Tjoukball	Zone Out	Rule Sequence	Smarties Up (Readiness and defending between the opponent and goal)	Four Pictures, Four Words (To shoot or pass to teammate)	Cleaning up the Backyard (Shooting at the tjouk)	Tchoukball
Class 6: Tchoukball	Catch It	Chance Chant	Toe Tag (Footwork and reaction to opponents and ball movements)	Thread the Needle (Which tchouk to shoot on)	Tchoukpot (Rebounding the ball off of the tchouk)	Tchoukball

2002) and physical education (e.g., Lodewyk, 2009). Meanwhile, on the TGfU-unit survey, students were asked to report the teacher's proficiency teaching the TGfU unit compared to their past PE teachers. Students were also asked to report their perceived level of physical activity in the TGfU-games unit compared to previous (regular) PE. These items were: "Compared to PE teachers I have had in the past, the guest teacher for this games unit taught" (rated from "much worse" = 1 to "much better" = 5); and, "Compared to regular PE, how physically active were you during this territorial game's unit? (rated from "much less active" = 1 to "much more active" = 5). Two open-ended items assessed what students "liked" and "disliked" about PE (for the PE experiences survey) and the TGfU games unit (for the TGfU-unit survey). These items were: "Use as much of the space below as you need to explain what you LIKED about this games unit in PE;" and, "In the space below, please explain what you LIKE about PE." The same items were used for the dislike items except "liked" was replaced with "disliked." These items have been used previously in PE (e.g., Lodewyk & Pybus, 2012).

The 34 Likert-style items of the survey consisted of established scales for self-efficacy (4 items), anxiety (4 items), need for cognition (8 items), value (six items; two items each for importance, usefulness, and interest), and entity (6 items) and incremental (6 items) ability conceptions. The wording of each of the scale items was modified slightly to apply to either PE or the TGfU-games unit. Self-efficacy, value (importance, usefulness, and interest), and anxiety were assessed using these scale measures from the *Motivated Strategies for Learning Questionnaire* (MSLQ; Pintrich et al., 1991). Sample items include: "It is important for me to learn the information taught in PE." (value); "I believe I will receive an excellent grade in PE (self-efficacy); "I have an uneasy, upset feeling when I am in PE" (anxiety). Entity and incremental ability conceptions were measured using the 12-item *Conceptions of the Nature of Athletic Ability Questionnaire* (CNAAQII; Biddle et al., 2003). Finally, the need for cognition was assessed using a shortened version (the eight items used previously in PE by Lodewyk and Gao, 2013) of the 18-item *Need for Cognition Questionnaire*

(NCQ; Kardash & Scholes, 1996). A sample item is: "I really enjoy tasks in physical education that involve coming up with new solutions to problems." Each of these scales have established concurrent, face, and content validity (e.g., Duncan & McKeachie, 2005) and satisfactory reliability coefficients (>.70) including in PE settings (e.g., Lodewyk et al., 2009; Lodewyk & Gao, 2010, 2013; Ommundsen, 2003).

Data Analysis

Statistical analyses were performed using the Statistical Package for the Social Sciences (SPSS; version 22.0) including the screening of variables for normality and computing scale descriptive statistics and alpha reliability coefficients (see Table 2). One-way repeated measures ANOVA (RM-ANOVA; p < .05) was used to assess the differences in levels of estimated grade, self-efficacy, value, ability conceptions, physical activity, anxiety, and need for cognition between previous PE and the TGfU-games unit. Data from the two qualitative survey items assessing students' likes and dislikes of PE and TGfU were analyzed using Creswell's (2007) recommended protocol of repeated examinations of the data are performed to enhance the specificity of interpretations. Following the verbatim typing of all responses separately for PE and TGfU and as either likes or dislikes, the main categories of words or phrases were identified, and patterns or themes were then established. For example, a theme within dislike of PE was "activities" and included main categories of words or phrases such as strength-training, running long distances, and playing sports that some students do not enjoy. This practice minimized coder bias as did a review of initial codes by having another independent researcher recode a portion of the data that revealed 96% coding consistency.

Results

Results revealed satisfactory alpha reliability coefficients (.63-.88; see Table 2) particularly for scales with fewer than 10 items (Loewenthal, 1996). The mean for the item assessing unit physical activity level compared to regular PE was 3.44 indicating

Table 2

Scale Descriptive Statistics and Reliability Coefficients for PE and TGfU

Cognition	Anxiety Value	Incremental Efficacy Conception	Ability Grade Conception	Entity Ability	Need for	Self	Estimated
			Physical Education				
Mean	4.14	4.05	2.73	3.00	4.90	4.87	81.44
SD	1.42	.69	.93	.60	.99	1.10	8.52
α	.80	.77	.84	.63	.77	.87	-
			Teaching Games for Understanding				
Mean	2.36	3.97	2.02	3.20	4.18	5.53	82.84
SD	1.04	.64	.66	.60	1.36	1.08	7.85
α	.66	.69	.77	.64	.88	.81	-

Note. N = 25; SD = Standard Deviation; α = alpha reliability.

that students reported being somewhat more active in the TGfU unit. Students also reported that the guest teacher was somewhat better (M = 3.80) than their past PE teachers. Since this difference was moderate and the students had only had their regular PE teacher for two weeks of the new academic school year, the effect of the guest instructor for the TGfU unit was not viewed as a confounding factor in this study; nevertheless, it is noted as a caution for interpreting the results.

Quantitative Differences in Ability Conceptions, Need for Cognition, and Motivation

The one-way repeated measures ANOVA investigating differences 260 in the adaptive outcomes between previous PE and the TGfU-games unit revealed significantly higher anxiety, $[F_{(1, 23)} = 29.36, p < .001, ES = .56]$; entity ability conception $[F_{(1, 23)} = 9.74, p = .005, ES = .30]$; and, value $[F_{(1, 23)} = 4.40, p = .047, ES = .16]$ in previous PE; whereas self-efficacy was higher for the TGfU-games unit $[F_{(1, 23)} = .5.15, p = .033, ES = .18]$. There was no statistical PE-TGfU difference in incremental ability conception $[F_{(1, 23)} = .33, p = .570, ES = .01]$; need for cognition, $[F_{(1, 23)} = 1.56, p = .225, ES = .06]$; or, estimated grade $[F_{(1, 24)} = 1.12, p = .301, ES = .05]$. To recapitulate, compared to previous PE, the girls in this study reported significantly higher self efficacy and lower anxiety, value, and entity ability conception in the TGfU unit.

Qualitative Differences in Enjoyment

Results of the qualitative data pertaining to students' likes and dislikes about PE and TGfU are provided in Table 3. Pertaining to PE, the girls generally liked being able to play and be active through participation in a wide variety of enjoyable and novel sports and games. Sample comments exemplifying this were: "I like doing the sports and activities that I enjoy." (Ariel); and, "Because its fun. I'm not good at most of them but I just think its fun trying out different sports." (Scarlet). The girls also valued the fitness-enhancing and social aspects of PE such as being physical active and working within a team. For example, Lauren stated that "PE is likeable for me because I can be occupied and active" and Catherine added "What I like about PE is being able to be a part of

Table 3
Thematic Findings for Enjoyment of PE and TGfU

Physical Education	
<u>Likes</u>	<u>Dislikes</u>
Activities (*n* = 23) 　- The variety of different sports and 　games. Active (*n* = 13) 　- Physically active; exercise, fitness. Playing (*n* = 8) 　- Playing and learning games and sports. Fun (*n* = 5) 　- Enjoyable Social (*n* = 4) 　- Working with others as a team.	Activities (*n* = 13) 　- Strength-training, running long 　distances, playing certain sports. Hygiene (*n* = 11) 　- Sweating, messy hair, and changing. Difficulty (*n* = 7) 　- Too demanding physically; strict. Drills (n = 4) 　- Doing the same drills over and over 　and not enough playing. Peer Comparisons (n = 4) 　- People watching and grading me.

Teaching Games for Understanding	
<u>Likes</u>	<u>Dislikes</u>
Learning (*n* = 22) 　- Learning new things; Using games to 　learn; different type of learning. Enjoyable and Active (*n* = 12) -　Fun; Getting fit. Unique (*n* = 10) 　- More games; Different approach; New 　games; Interesting. Social (*n* = 7) 　- Teamwork and leadership.	Timing (*n* = 22) 　- Felt rushed; Not enough time for the 　final main game; Too many 　transitions; Lacked flow because of 　too much talking. Constant Busy Work (*n* = 8) 　- Tiring; Too easy to be beneficial. Repetitive (*n* = 7) 　- Too many boring and similar games 　and explanations. Activity (*n* = 6) 　- The sport(s) we were learning.

Note: n = frequency comments for each theme.

a team, almost." Themes emerging for dislike of PE included the over exertion (e.g., running a lot and long distances) and level of strictness the girls occasionally felt and how it compromised their enjoyment in PE. To illustrate, Amelia mentioned "Sometimes it feels like a huge challenge to complete the whole hour of PE. I think PE should be challenging up to a point where you still have fun." Concerns about their hygiene (i.e., sweating, appearance) and changing for PE were also prominent as was having to complete drill-like activities and engage in some sports that were previously learned. Sample comments for these included "Racoon eyes, sweat, frizzy hair, and smelling. (Mildred); and, "In elementary school we did the same drills every year and it was really boring." (Jaimey). Finally, there was dislike of feeling observed (i.e., graded) and compared by peers. For example, Scarlet stated: "I don't like distance or speed running because I usually do that by myself and I am better when no one is watching or grading me."

What the girls generally liked about TGfU was the increase in learning in a different way, particularly through the playing of many new games rather than drills along with its increased emphasis on teamwork and the development of leadership skills. Sample comments exemplifying this were: "What I liked about it was that you play games to learn rules of one game." (Ruby); "I liked how it was a different type of learning and that we played many games instead of just doing drills." (Amelia); "I liked how you had to use lots of team work and talk to your other teammates on how you could score a point or work together on how your going to get past the opposite team." (Marie); and, "I also liked the sports that we were taught, they weren't the traditional sports, so it was a level playing field for everyone." (Jessica). Themes emerged for dislike of TGfU included a feeling of being rushed, the numerous transitions that broke up the flow of the lesson, and not saving time to play enough of the final game of the lesson. To illustrate, Cierra mentioned: "I disliked how we didn't get that much game play, it'd only be for a few minutes then the teacher would call us to explain the next activity. I felt like, even though there were a lot of games, they were all really short." Rose added that "It seemed like we had to be called back in to talk a lot after short periods of times of playing." Other dislike themes were some of the activities (e.g., Catherine's comment that "I didn't really enjoy the sport we were learning, I think that if it was a different sport I would have enjoyed it more."), the similarity in the activities (e.g., Scarlett's mentioning that "I didn't like that we did a lot of similar games and activities to learn the same strategies. I would prefer different games every class to keep it interesting."), and the amount of explanation needed from the teacher (e.g., Sabrina noting that "What I disliked about the games was they took a lot of explaining.").

Discussion

The aim of this study was to assess if there would be significant differences between regular PE and a TGfU-games unit in grade nine girls' self-reported likes, dislikes, self-efficacy, value, ability conceptions, physical activity, anxiety, and need for cognition. Results revealed that, compared to previous PE, the girls in this study reported significantly higher self-efficacy and lower anxiety, value, and entity ability conception in the TGfU-games unit. Pertaining to PE, the girls generally liked being able to play and be active through participation in a wide variety of enjoyable and novel sports and games along with the fitness-enhancing and social aspects of PE. They disliked the over-exertion (e.g., running a lot and long distances), level of strictness, hygienic vulnerability (i.e., sweating, appearance, changing for PE), overuse of drill-like activities and sports that were previously learned, and feeling observed (i.e., graded) and compared by peers. Aspects of TGfU that the girls generally liked were the increase in learning in a different way, particularly through the playing of many new games rather than drills, along with the increased emphasis in TGfU on teamwork and the development of leadership skills. Dislikes of TGfU were some of the activities, the amount of teacher explanation, feeling rushed, having numerous transitions, and not saving time to play enough of the final game of the lesson.

Ability Conceptions, Need for Cognition, and Indices of Motivation

Elevated self-efficacy and lower anxiety and entity ability conception (believing less that ability was an uncontrollable and unchangeable entity) after the TGfU-games unit may be related to the learner-centered constructivist emphasis in TGfU in the form of choice, decision-making, problem-solving, and adapting along with the teaching of skills and tactics for favorable transfer into the actual games the students play (Mandigo et al., 2007; Rink, 2010; Singleton, 2009). These emphasized features of TGfU may help students to have more tangible, chosen, and controllable criteria from which to calibrate their self-efficacy to perform. These features along with the collaborative aspects might also serve to reduce anxiety levels and beliefs that ability is a fixed entity that effort can do little to change. These findings are somewhat reflected in previous research that has found increases in self-efficacy for performing skills (Harrison et al., 2004) and decision making (Gubacs-Collins, 2007) in university students experiencing TGfU; and, elevated perceived sport competence and lower pressure or tension in a six-week TGfU unit compared to a traditional skill-oriented unit with students aged 11-14 (Jones, Marshall, & Peters, 2010).

The finding in this study that students' lower value (interest, importance, and usefulness) for TGfU than for previous PE might be partially attributable to the novelty of the TGfU experience and to resistance to changes to traditional experiences in PE (Dyson, 2005). For example, Mandigo, Holt, Anderson, and Sheppard (2008) reported boredom with TGfU in 15% of their adolescent sample. Further, some scholars (Light, 2003) have noted that TGfU may be better received (i.e., enjoyed) by students who have had somewhat negative previous experiences in PE, sport, and physical activity than by students who rate enjoyment in these experiences more highly. Surprisingly – based on the historical emphasis in TGfU for increased cognitive engagement (e.g., Singleton, 2009) and empirical findings associating TGfU with enhanced tactical awareness and strategic play (e.g., Jonassen, 1991), understanding the need for skills (Hopper, 2002), decision-making and critical-thinking about game play (Turner & Martinek, 1999) and awareness of personal adaptations necessary for game performance (Butler, 2006) – there was not a significant difference in the need for cognition between TGfU and previous PE in this study. Future research should use a longer or additional TGfU

unit(s), and more diverse schools, PE classes, and game forms (e.g., net-wall, target, striking fielding, territorial). This is because a value for and need for cognition in TGfU may not increase equally in all groups within PE or until students have had enough time to acclimate themselves to its responsibilities and benefits.

Enjoyment

The aspects of PE that girls reported liking and disliking corroborate findings of previous research (Davis, Zhu, & Haegele, 2018; Ennis, 2000) as do some of these findings relative to TGfU. For example, previous research has also noted the importance of novel game-like rather than more drill-oriented activities (Mandigo et al., 2007) because the former can better equate students and reduce harmful judgments of relative ability (Ennis, 2000) while enhancing enjoyment and intrinsic motivation (Jones et al., 2010), especially if have are sequenced in developmentally-appropriate ways (Butler, 2006). The girls in this study also liked the increased emphasis in TGfU on teamwork and the development of leadership skills. Others have also noted increases in student-reported collaborative problem-solving, independence, and responsibility through TGfU (Butler, 2006; Mandigo, et al., 2008; Rikard & Banville, 2006).

A final noteworthy finding of this study was the list of students' dislikes about the TGfU games unit; foremost being not saving time to play enough of the final game of the lesson. Because the rationale and expressed rationale for much of a TGfU lesson is preparing tactically and skillfully for the culminating game, it seems important for teachers to regulate time to avoid compromising adequate time for this final phase. Partly for this and some of the other expressed dislikes about TGfU in this study (e.g., the amount of teacher explanation, feeling rushed, having numerous transitions) other research has reported, some (Mitchell, Oslin, & Griffin, 2013) have proposed simplifying the model to either three or four phases (game form, tactical and skill development, and culminating game). The findings about likes and dislikes relative to TGfU and PE in this study indicate that both have aspects that students find enjoyable yet, neither fully meets students' preferences. It would be useful for future research to study these and other constructs with a larger sample size to enable more specific differentiation by gender and ability level.

Limitations

There were several study limitations worth highlighting. First, the use of a guest teacher with expertise in TGfU was performed to ensure proper teaching of TGfU, although this may have resulted in some teacher effect on students' responses. This effect appeared minimal due to the students having had their actual PE teacher for only two weeks prior to the unit (since the TGfU unit was taught only two weeks into the new school and academic year) and because students reported their guest teacher as only "somewhat better" than their past PE teachers. Second, the use of some self-report survey data is susceptible to some inaccuracy (e.g., bias) so it would be useful future research to also use other measures such as think-aloud procedures and accelerometers to measure physical activity levels. Third, the TGfU-games unit in this study was only six lessons with one teacher and class so transferability is limited to similar units and contexts. Fourth, although the

size of the sample in this study was somewhat small for making robust statistical inferences, it is also worth noting that a smaller sample size could also inflate the chance of Type 2 error – that is, underinflating or suppressing existing differences between groups (Zhu, 2012). Finally, this study only investigated associations in some motivational constructs as a function of TGfU and previous PE so causal claims are not warranted.

Conclusion

There is much from this study that adds to current instructional and curricular theory for both researchers and practitioners. The use of adolescent girls in an authentic PE and TGfU class setting is particularly valuable (Rink, 2010). Fresh insight into the differences in self-efficacy, value, need for cognition, ability conceptions, and students' likes and dislikes as a function of TGfU and previous PE illuminate how TGfU might influence students' motivation and the need for cognition in PE. For example, a higher self-efficacy and a lower anxiety and entity ability conception following the TGfU unit compared to regular PE might reflect benefits of some constructivist features of TGfU. Meanwhile, there are aspects of both TGfU and previous PE that students both like and dislike. The lower value for TGfU and absence of any differences in the need for cognition between TGfU and PE in this study might reflect students' resistance to change and the short exposure students had to TGfU. The lower value for TGfU might also reflect findings by Fry and colleagues (2010) wherein value for a constructivist game concept approach partially depended on how well teachers applied the approach so adequate training of physical educators to such methods is important. The findings of this study should spur additional research into how TGfU may or may not better engage students in PE as a function of gender and ability using a larger sample, other game forms, and a four-phase rather than a six phase rendition of TGfU.

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