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PEDAGOGY

Differences in Enjoyment and Need for Cognition Relative to Teaching Games for Understanding, Physical Education, and Intentions to Enroll

Ken R. Lodewyk and Scott Robertson

Abstract

The primary aim of this quasi-experimental study was to investigate differences in enjoyment and need for cognition between regular physical education and a Teaching Games for Understanding (TGfU) unit by level (higher or lower) of intention to enroll in physical education. A sample of 71 ninth-grade physical education students completed a survey assessing enjoyment and need for cognition before and after participating in a 2-week TGfU territorial games unit. Results included significantly lower enjoyment for TGfU than for physical education both overall and among students with higher intentions to enroll. Students more prone to future enrollment also had higher need for cognition during TGfU than physical education after the study controlled for need for cognition in physical education. It may be necessary to better explain and justify TGfU especially with students higher in intentions to enroll while striving to enhance cognitive engagement during TGfU in those with lower intentions to enroll.

Research has revealed that motivation for physical activity, sport, and physical education (PE) tends to decrease in adolescence, which

Ken R Lodewyk, Department of Kinesiology, Brock University. Scott Robertson, Department of Kinesiology, Brock University. Please send author correspondence to klodewyk@brocku.ca

likely coincides with lowered enrolment in PE when it becomes an optional subject (Centers for Disease Control and Prevention, 2013; Lodewyk et al., 2009; Luke & Sinclair, 1991). Some studies have reported that enrollment in optional high school PE is only 19% in the United States (Shen, 2010) and 49% of relevant students in the province of Ontario in Canada (Sulz et al., 2010). Much of this attrition is related to the PE content (e.g., boring, irrelevant, and based too much on traditional sports) and instruction often deemed to be too teacher controlled (Baron & Downey, 2007; Ennis, 2000; Lodewyk & Pybus, 2013). Teaching Games for Understanding (TGfU) is an instructional model that shifts emphasis from a rather traditionally direct (teacher-centered) method of instruction to one more learner centered by, for example, emphasizing the holistic engagement of students in a variety of modified game contexts to help them understand how to play games (e.g., make choices, transfer tactics, develop skills, and solve problems; Griffin & Patton, 2005; Sproule et al., 2011). More research is needed into relations between TGfU, favorable motivational and cognitive outcomes in students, and intention to enroll in future PE (Harvey & Jarrett, 2014; Lodewyk & Pybus, 2013; Sulz et al., 2010). This study used a quasi-experimental (pretest–posttest) design to investigate ninth-grade students' likes and dislikes of TGfU, along with differences in their enjoyment and need for cognition between regular PE and a novel territorial games TGfU unit in PE, relative to their level (higher or lower) of intention to enroll in optional PE. The study stems from social cognitive theory and its assertions of the reciprocal importance of the affect, beliefs, environment, and cognitive processing on intentions and subsequent behavior (Bandura, 1977).

Teaching Games for Understanding

As a learner-centered approach to teaching games that is grounded in constructivist learning theory (Griffin & Patton, 2005), TGfU places the emphasis on the students/players who are participating in the games ensuring that their core needs are met both by giving them instruction and by providing them with more autonomy (i.e., choice) and responsibility than does traditional instruction (Dyson, 2005; Griffin & Patton, 2005; Light, 2002; Richard & Wallian, 2005; Sproule et al., 2011). For example, this can occur through opportunities for students to modify the original, formal, adult version

of a game to one more personalized and developmentally suited to their participation, learning, and enjoyment. Each learner's prior knowledge is welcomed through enriching higher-order cognitive engagement activities such as problem solving, questioning, exploration, experimentation, and personally relevant applications (Richard & Wallian, 2005). This form of instruction and learning shifts the role of the instructor from more of a director and transmitter (in traditional instruction) to a facilitator who enables students to create knowledge for themselves and their peers (Dyson, 2005). More specifically, TGfU situates learning within environments that are constantly changing, placing students into situations in which they must adapt and build upon their prior knowledge (e.g., of game rules) to create new knowledge and learning (Hopper, 2011).

Another core feature of TGfU is the thematic grouping and sampling of games with related structure and pedagogical objective (e.g., target, striking and field, territorial, and net and wall games). In other words, teachers display similar, albeit different, games to their students, allowing for skill and tactics development, along with the recognition of the similarities and differences between games, ultimately resulting in enhanced student understanding of how various skills and tactics can be applied in a variety of games (Butler & McCahan, 2005; Mandigo et al., 2007). TGfU instruction also modifies elements (e.g., rules, playing area, number of players, or equipment) of more complicated (formal) games such as soccer, cricket, tennis, and golf to highlight or represent important aspects (e.g., scenarios, tactics, skills, rules) of the to-be-learned formal game. These modified games provide an opportunity for physical educators to exaggerate (stimulate) specific tactics or problems relative to the complexity of each game and provide opportunities for students to master and adapt them contextually (Holt et al., 2002; Hopper, 2011; Mandigo et al., 2007). This could, for example, involve modification of the number of dribbles a player can take during a basketball game, which increases the necessity for players to find and learn the concept of open space during the game.

Although PE lessons using TGfU have been condensed into three or four steps (e.g., Griffin & Patton, 2005; Harvey & Jarrett, 2014), they have traditionally progressed through six, namely, (1) Game, (2) Game Appreciation, (3) Tactical Awareness, (4) Making

Appropriate Decisions, (5) Skill Execution, and (6) Performance (Bunker & Thorpe, 1986; Griffin & Patton, 2005; Holt et al., 2002; Mandigo et al., 2007; Werner et al., 1996). This progression is designed to counter how games are traditionally taught (Mandigo et al., 2007) and to follow the evolution of learning any game (Werner et al., 1996) with students being provided or constructing information and activities at the most opportune and appropriate times to aid them in learning (Hopper, 2011). It is beyond the scope of this article to explain and rationalize each step beyond the following summary, so we encourange readers to read the sources cited herein.

Enjoyment, Need for Cognition, and Intention to Enroll

Research has revealed many benefits of TGfU on adaptive PE outcomes such as enjoyment (Lodewyk & Bracco, 2019; Mandigo et al., 2008). For example, Morales-Belando et al. (2018) reported an increase in enjoyment and intention for being physically active following a high school floorball unit using TGfU. Lloyd and Smith (2010) asserted that TGfU enables students to enjoy and learn more about the games because their individual needs are met as TGfU facilitates the interconnection of the physical (performance of the skill), cognitive (understanding why and how to perform the skill), and affective (positive emotion from use of the skill). Wright et al. (2009) reported that students tend to conceive of the TGfU learning environment as more interesting and fun than typical PE classes because of the variety of content being taught, more time being physically active and game playing, a more fulfilling social climate, and activities structured to provide a more appropriate challenge. Mandigo et al.'s (2008) findings corroborate these and add that students are also more competent in what they were doing and learning. Despite the positive features, these latter two studies also noted that some students disliked the learning environment and activities, specifically the boring and frequent discussions, game skills that were too difficult, and the structure of some of the games (territorial games in particular).

Another availing feature of TGfU might be the opportunity it provides students to experience the game first and to progressively apply their own solutions to problems that have "no one correct answer." In other words, there is a wider definition of success beyond that of the instructor or peers. This notion aligns with Bandura's

(1977) notion of skill mastery asserting that if students are able to achieve success in their creation of appropriate responses, they might develop stronger beliefs in their ability to respond to situations and believe they can succeed in new situations. The authentic nature of TGfU might also facilitate students to connect their learning and have more success, particularly in the earlier stages of learning about the game. This authentic approach also allows for relevant timely decision-making activities and the provision of feedback in a more relevant setting, compared with traditional instruction, that may be more widely accepted and welcomed by students (Hopper, 2011).

"Need for cognition" (NC) is a term reflecting a person's satisfaction in solving cognitive challenges that require reasoning, critical thinking, and problem solving (Kardash & Scholes, 1996). It is associated with many adaptive academic outcomes including effort, enjoyment, attentiveness, and success on complex tasks (Nussbaum & Bendixen, 2003). There is some evidence of the role of NC in PE (e.g., Lodewyk & Gao, 2010) and TGfU (Lodewyk, 2015). TGfU may facilitate NC in the instruction of games through the use of more higher-order thinking skills such as creative thinking, problem solving, and decision making (Butler & McCahan, 2005; Gubacs-Collins, 2007); reflection, critical thinking, and self-regulation (Richard & Wallian, 2005); and tactical knowledge (Gubacs-Collins, 2007; Morales-Belando, 2018). Thus, the focus of instruction shifts from memorization of procedures to the development of flexible thinkers. TGfU instruction in games such as volleyball can also improve procedural (rules and techniques) and conceptual (strategies) knowledge in both high- and low-skilled individuals (Harrison et al., 2004).

Intention to enroll in PE is a construct often applied to students' intention to enroll in PE once it becomes an optional course in high school (Gao et al., 2009). Although no known research directly examines the relationship between TGfU and intentions to enroll in PE, enjoyment in sport, physical activity, or PE can be a predictor of enrollment or participation in these settings (e.g., Luke & Sinclair, 1991; Sulz et al., 2010). Studies in PE (e.g., Lodewyk & Pybus, 2013) have revealed that students choose to enroll based upon a number of factors, including their enjoyment of activities, their perceived competence of themselves, the social interactions present in the class,

and the types of activities performed. This and other studies (e.g., Gao et al., 2009) have revealed additional correlates of intention to enroll in PE as self-efficacy, value for, and their grade in PE, along with weekly levels of exercise outside of PE.

Objectives

There is a need for more TGfU-based studies investigating interactions between students' physical, cognitive, and affective domains relative to traditional PE (Harvey & Jarrett, 2014) and intention to enroll in PE (Gao et al., 2009; Lodewyk & Pybus, 2013; Sulz et al., 2010). Consequently, this study was designed with four objectives: first, report descriptive statistics and correlations between enjoyment and NC both preunit (PE) and postunit (TGfU); second, reveal any significant differences in these constructs from the preunit (PE) to the post-unit (TGfU); third, investigate the aforementioned pre–post differences in enjoyment and NC when tested separately by higher and lower intention to enroll in optional PE; and finally, qualitatively learn more about students' "likes" and "dislikes" about the territorial games TGfU unit.

Method

Participants and Procedure

After securing ethical clearance from a local university, necessary preapprovals were attained from the school board, school principal, and participating teachers. Following a short scripted verbal presentation to each of the four classes from a graduate-student researcher to explain the study and consent process, consent was secured from willing students and their parent/guardian through a letter and consent form that was sent home with each student. Students were informed and reminded of their right to refuse to participate and/or answer any questions and to remove themselves from the study at any time without consequence. Consents were provided by 84 out of 112 students (75%) from four ninth-grade PE classes. One week prior to experiencing a territorial games unit using the TGfU instructional model in those four PE classes, 71 of the consenting students (41 females, 57.7%; 30 males, 42.3%) aged 13 to 15 completed a preliminary survey housing items assessing demographic information, intention to enroll in future optional PE, and levels of

enjoyment and NC in PE. One week after participating in the TGfU unit, 66 of the original 71 students completed the same measure (without the demographic items), except reworded for assessment of these constructs relative to TGfU. A qualitative item was also added to the postunit (TGfU) measure for assessment of students' likes and dislikes of the TGfU unit. The two surveys were completed during regularly scheduled PE class time under teacher and researcher supervision, and the duration for completion was approximately 12 to 15 min.

Setting

All four classes were in a single public high school located in large urban area (population approximately 350,000) of south-central Canada and were part of the same legislated (Provincial Ministry of Education) Grade 9 Physical and Health Education curriculum that included an endorsement of TGfU use by teachers. Two of the classes were designated for females and the other two for males; all students participated in the unit regardless of research consent. Each class and the TGfU territorial games unit were taught by three PE teachers (two females and one male). Preliminary personal interviews with each teacher revealed that they had 21, 8, and 9 years of teaching experience with the most of those in Grade 9 PE and had no prior experience teaching using Teaching Games for Understanding. The duration of most instructional units in ninth-grade PE in the school were normally 1 week (5 school days) with each focusing on one activity, game, or sport. The school had several venues for teaching these PE classes and units. These included one larger and one smaller gymnasium, a fitness studio, weight-training room, health classroom, and a small "overflow" playing area on the balcony overlooking the large gymnasium that was only used if additional space was deemed necessary by the teachers. The TGfU unit in this study utilized the larger and smaller gymnasiums. Maintenance work on the bleachers located on the balcony during the second week of the unit limited the space to the small gym and to half of the larger gymnasium (separated by a large drop-down curtain). This was not deemed as threatening to the validity of the study, because there was still adequate space to teach the classes and the revised setting resembled typical challenges and adaptations necessary of physical educators who must adapt to space constraints. We, however, note

the less-than-ideal gym space during the second week of instruction as a limitation on the classes.

Teaching Games for Understanding Unit

The territorial games TGfU unit and each of its lesson plans were created by two researchers with expertise in PE pedagogy including TGfU theory. This ensured that the unit modeled appropriate practice and application of TGfU. For example, because TGfU follows a thematic approach, a 2-week (10-lesson) unit was developed to teach students transferable tactics, skills, and rules across several territorial games/sports rather than just one. Compared with other game forms such as striking/fielding (e.g., cricket, baseball), net/wall (e.g., squash, volleyball, and badminton), and target games (e.g., golf, bowling), territorial games involve players defending a defined area or goal while trying to pass or move an object into the opposing team's area or goal. Examples include soccer, rugby, and basketball. The first four lessons focused on team handball. Lesson 4 served as a basic introduction to the key concepts of touch rugby, followed by three lessons centered on ultimate disc (Frisbee) and culminating in one lesson using flag football. Only the first eight lessons could be completed because of school closures for a holiday and professional development day at the end of the 2 weeks allotted to the study.

In line with theory aligned to the six-step TGfU lesson (e.g., Bunker & Thorpe, 1986; Griffin & Patton, 2005; Mandigo et al., 2007), each lesson in this study began with a representation of the game and then proceeded through the game appreciation, tactical awareness, making appropriate decisions, and skill execution phases, culminating in the performance of a close version of the actual regulation game (see Table 1 for a list of activities within each lesson's six steps). More specifically, in the initial Game step, students were introduced to a developmentally appropriate modified version of a formal game. This provided motivation and "set the stage" for subsequent learning. The Game Appreciation stage served to facilitate the construction of declarative understanding and valuing of the game rules in students that will relate to subsequent learning of skills, tactics, and strategies during gameplay. This could be, for example, recognizing that changing the height of the net or the length of the court would result in an altered strategy to achieve success in the game. During the Tactical Awareness stage, students were prompted

Table 1
Overview of the Territorial Games Unit Through the Teaching Games for Understanding Model

Lesson	Game	Game appreciation	Tactical awareness	Making appropriate decisions	Skill execution	Performance
1-Team Handball	Skittles	Group Discussion	Team Discussion	Uneven 7-Up	Catch and Shoot	4-Corner Handball
2-Team Handball	Monkey in the Middle	Think-Pair-Share	Player in the Middle 2.0	Round the Outside	Hoop Pass	Team Handball
3-Team Handball	Continuous Outlet	Group Discussion	Rap It Up	Outlet	Outlet Pass and Trail	Team Handball
4-Team Handball	Speedball	Brainstorm	4-Goal Handball	5-3-2 Goal	Stuck Defense	Team Handball
5-Rugby	Ultimate Rugby	True/False	3-on-2 Rugby	4-on-2 Rugby	Egg Toss and Move & Pass	Modified Touch Rugby
6-Ultimate Disc	7-Up	Group Discussion	7-Up Observation	Challenge	Modified Kan Jam	Ultimate Frisbee
7-Ultimate Frisbee	Hoopster	Discussion	Frisbee Basketball	Where to Throw?	Egg Toss	Ultimate Frisbee
8-Ultimate Frisbee	End Ball	Rule Quiz-4 Positions	Team Tactics Development	Small-Sided Flag Game	Race to the Cone	Ultimate Frisbee
9-Ultimate Frisbee	Sideline 3-Person Pass	Find Your Match	Think-Pair-Share	Sides Before End	Gate Catch	Ultimate Frisbee
10-Flag/Touch Football	Rock Paper Scissors Football	Group Discussion	RPS Flag Football	3-v-3 Flag Snatch 7-Up	Flag Snatch	Continuous Flag Football

to reflect on their prior experience and increase in their understanding of various tactics that can be employed within the parameters of the game to give them an advantage over their opponent. In the Making Appropriate Decisions stage, students decided how to self-regulate and apply and adapt those and other tactics and skills in additional modified gameplay situations. At the Skill Execution stage, students were likely ready to better understand the skills that needed to be improved and why (e.g., knowing enough about the game to understand how certain skills could be an asset). They spent time improving skills by using game-like activities to promote transfer to skills to the game. Lessons culminated in the Game Performance stage, wherein students applied and demonstrated, within the context of a more advanced version of the formal game, what they learned thus far throughout the lesson. An emphasis of the unit was for students to learn many of the transferable tactics across these games (e.g., finding space, defending space, playing with width). The tactical themes by lesson included (1) creating space, (2) maintaining possession, (3) offensive and defensive transitions, (4) defending space, (5) defending space based on ball movement, (6) finding space, (7) throwing choices, (8) defending the object, (9) playing with width, and (10) obtaining possession.

Teacher Preparation and Guidance

Initial discussions with each teacher revealed that each had very little if any previous experience or knowledge with TGfU and taught predominantly using a direct (teacher-centered) style, although they were very interested in learning how to teach less directly. A few weeks before the unit, Scott Robertson, who had expertise in TGfU, provided the three participating teachers in this study a 2-hr training seminar (in-person) on TGfU. It included a PowerPoint presentation and a print package for the teachers with the presentation contents and the territorial games TGfU unit. The presentation provided information about the history, rationale, transferable tactics, appropriate use of questioning, pedagogical principles for the use of TGfU during each of the six steps described earlier, and implementation of TGfU for teaching games. After the seminar, teachers participated in a lesson from the unit to experientially understand both lessons and TGfU. A final part of the training involved the teachers working together with Robertson to understand, refine, ask questions, and

better comprehend the designed territorial games TGfU unit and lesson plans. Progressing through the lessons with the teachers ensured the teachers understood how the lessons reflected the principles of TGfU; ensured the lessons met the needs of the students in the participating classes; aided in making the lessons more relevant and personal for the teachers; and ensured alignment with school policies, procedures, and curriculum. Following the training, the teachers indicated their satisfaction in their understanding and level of preparation for teaching the TGfU unit.

Finally, as recommended by Memmert and Koenig (2007), Robertson was also readily available during the 2-week TGfU unit to serve as a guide and resource for the teachers, to clarify any of their questions or concerns about the lessons or activities, and to ensure they were closely adhering to the planned unit and lesson plans and protocol. For example, Robertson observed the full first lesson for two of the classes and half of that lesson for the other two classes, as those classes were held simultaneously. Robertson also observed portions of several of the other lessons in each class, maintained regular contact personally or by e-mail with the teachers to debrief the lessons, and provided clarifications to the teachers when asked on only a few occasions. This collectively provided researcher confidence in the fidelity of the intended implementation of the TGfU unit by the three teachers.

Measures

Demographics, Intention to Enroll, and Preferences About TGfU

The first items on the preunit survey collected demographic information (e.g., age, gender) and culminated in the 5-point (1 = *not at all*, 5 = *very much*) Likert-style items measuring enjoyment and NC. The one item in this preunit survey that measured students' intentions for future participation in PE has been used in research to do so (e.g., Gao et al., 2009). Because all participants in this study were in Grade 9, the item was "In Grade 10, 11, and 12, you will have a choice whether you want to take physical education. How much would you want to take it?" The postunit measure used the same items for enjoyment and NC with minor changes to refer to the TGfU games unit they just completed rather than PE. The postunit measure also had the open-ended item that assessed students' preferences

(i.e., likes and dislikes) in the territorial games TGfU unit. The item was "In the space provided, please explain the main reasons why you liked or did not like the past games unit in PE. Remember there are no right or wrong answers." This question closely aligns to one used by Lodewyk and Pybus (2013) to assess students' preferences (likes and dislikes) in PE. The survey items were counterbalanced with each of the items from a particular scale (e.g., NC) distributed across the survey so similar items were not close to each other. Several additional Likert-style items were used for purposes beyond this study.

Enjoyment and Need for Cognition

Enjoyment was measured with the shortened Physical Activity Enjoyment Scale (S-PACES), validated in youth by Dishman et al. (2005). The measure is well established in the research literature, having adequate factorial and predictive validity and alpha reliability coefficients ranging from .77 to .86 (e.g., Gao et al., 2013). The S-PACES houses 16 items (seven negative and nine positive) on a 5-point Likert-style scale (1 = *disagree a lot*, 3 = *somewhat agree*, 5 = *agree a lot*). To reduce the length of the survey as done previously by others (Dishman et al., 2005), this study used only the negatively worded statements. These seven items were later reverse scored to shift their results to a positive valence. The stem for the preunit items was "In physical education class…" whereas for the postunit items it was "In this unit of my physical education class…" A sample item was "I feel/felt bored." To assess NC, this study used the shortened (eight-item) scale used previously in PE (e.g., Lodewyk & Bracco, 2019) from the original 18-item NC Questionnaire (Kardash & Scholes, 1996), including the same 5-point response options as for the enjoyment scale. A sample item was "I really enjoy tasks in physical education that involve coming up with new solutions to problems." Both of these abridged scales have been used and validated in the research literature through, for example, satisfactory alpha reliability (> .70) and expected relations with other constructs (Lodewyk & Bracco, 2019; Lodewyk & Pybus, 2013).

Data Analysis

The first three objectives of this study involved quantitative data analysis completed using the Statistical Package for the Social Sciences (version 22.0). Scale means for enjoyment and NC were the

computed average of the seven items of the enjoyment scale and of the eight items of the NC scale. As reported, both used the same 5-point Likert scale. Normality statistics (e.g., skew and kurtosis) and Cronbach's alpha reliability coefficients for each construct were computed and screened. Bivariate (Pearson) correlations were then analyzed for assessment of the relations between enjoyment, NC, and intentions to enroll in PE both preunit and postunit. Repeated-measures analysis of variance (RM-ANOVA) answered the second objective (preunit and postunit differences in enjoyment and NC). The third objective (pre–post differences in enjoyment and NC when tested separately by higher and lower intention to enroll) was resolved through separate RM-ANOVA for higher and lower intention to enroll and separate analysis of covariance (ANCOVA) for differences in post-TGfU enjoyment and NC, after the study controlled for the effects of pre (PE) enjoyment and NC.

The fourth research objective—discovering more about what students like and dislike about the territorial games TGfU unit—was analyzed through responses to the single open-ended item in the postunit survey. Creswell's (2013) qualitative multiple-step data analysis (spiral) procedure was applied, wherein data were first written verbatim and then coded after being read entirely. This allowed for an overall understanding of the entire sample. All of the data were then read again and major ideas or themes considered from ideas repeated in the data. These became the categories (or themes, used interchangeably) for data analysis. With this list, data points were placed into one or more categories based on their relevance to each. Specific themes for each category were then developed. These informed their larger category in which they were a member. This method has been used extensively in research (e.g., Lodewyk & Pybus, 2013). For intercoder agreement (Creswell, 2013), another independent qualified researcher (graduate student) from the same university and of a similar educational path (master's degree in PE) who was not involved in the study coded (using the original coding scale) a small (10%) randomly selected sample of the raw data. There was 93.8% agreement, which is considered highly satisfactory (Creswell, 2013). Cases that were discrepant were discussed until a classification was mutually agreed upon.

Results

Data preparation and screening procedures followed protocols by Tabachnick and Fidell (2006). Results signaled that normality statistics (e.g., skew, kurtosis) for the variables were satisfactory, except for enjoyment in preunit, which had an elevated kurtosis value of 5.82, compared with standards of between 3.00 and -3.00 for the sample size used in this study. This signals that students in this study generally reported very high levels of PE enjoyment. Hence, the recommended log transformation was performed in preunit and postunit enjoyment, resulting in acceptable kurtosis in both (1.91 and -.07). The alpha reliability coefficients for the preunit and postunit enjoyment and NC were satisfactory ($\alpha = .61–.88$) for scales with these 10 items (Loewenthal, 1996). The bivariate correlation between the original and transformed enjoyment scale was .98 both pre- and post-unit. Table 2 provides the bivariate correlations between constructs. As Table 3 presents, results for intention to enroll in PE ($M = 3.55$, $SD = 1.09$) were dichotomized into those with higher ($n = 40$, $M = 4.35$, $SD = .48$; responding 4–5 on the 5-point scale) or lower intentions to enroll ($n = 31$, $M = 2.52$, $SD = .72$; responding 1–3 on the 5-point scale). These dichotomized scales were normally distributed (Tabachnick & Fidell, 2006). Finally, to control for potential teacher effect, this study performed separate analyses of variance for the preunit and postunit with enjoyment and NC as the dependent variables. The three teachers taught their own class of physical education in this study, so each also taught their TGfU unit separately from the others. Teacher ($n = 3$) served as the between-subject factor. Results revealed no significant ($p < .05$) teacher effect in the constructs either preunit, Enjoyment: $F(2, 68) = .481$, $p = .620$, $\eta^2 = .014$, NC: $F(2, 68) = .673$, $p = .514$, $\eta^2 = .019$, or postunit, Enjoyment: $F(2, 63) = 1.25$, $p = .293$, $\eta^2 = .038$, NC: $F(2, 65) = .539$, $p = .586$, $\eta^2 = .017$.

Results pertaining to the first objective revealed that the sample was generally high in preunit (PE) enjoyment and moderate in NC. Enjoyment correlated significantly to intention to enroll in both PE ($r = .54$; $p < .01$) and TGfU ($r = .30$; $p < .05$). Bivariate correlations between NC and enjoyment and intention to enroll were higher and more significant ($p < .05$) for TGfU ($r = .25–.28$) than for PE ($r = .15–.19$). The RM-ANOVA testing the second objective

Table 2
Pearson Bivariate Correlations

Variable	Enjoyment	Need for cognition	Intention to enroll
Enjoyment	-	.28*	.30*
Need for cognition	.19	-	.25*
Intention to enroll	.54**	.15	-

Note. N = 71. Postunit (TGfU; n = 66) correlations in the upper diagonal. Preunit (PE; n = 71) correlations in the lower diagonal.

**p < .01. *p < .05.

Table 3
Descriptive Statistics

	Enjoyment				Need for Cognition				Intention to enroll in PE
Statistic	Preunit (PE)		Postunit (TGfU)		Preunit (PE)		Postunit (TGfU)		
N	71		66		71		66		71
M	4.47		4.28		3.23		3.28		3.55
SD	.65		.78		.59		.57		1.09
a	.77		.88		.70		.61		-
	Low IE	High IE	Low IE	High IE	Low IE	High IE	Low IE	High IE	-
N	31	40	28	38	31	40	28	38	-
M	2.11	2.76	1.99	2.45	3.20	3.27	3.12	3.40	-
SD	.92	.43	.95	.78	.52	.63	.63	.52	-

Note. N = 71. a = alpha reliability coefficient; IE = intention to enroll; PE = physical education; TGfU = Teaching Games for Understanding.

(differences in enjoyment and NC preunit and postunit) revealed significantly higher enjoyment for PE (preunit) than for TGfU (postunit), $F(1, 65) = 4.81$, $p = .032$, $\eta^2 = .069$, and no significant difference in NC, $F(1, 65) = .003$, $p = .956$, $\eta^2 < .001$. For the third objective, the separate RM-ANOVAs for the two (higher and lower) intention to enroll groups revealed that only enjoyment differed (lower) significantly postunit compared to preunit and this was in the higher future-enrollment group, $F(1, 37) = 7.41$, $p = .01$, $\eta^2 = .167$. Results of ANCOVA testing for differences between high and low intentions to enroll in post-TGfU enjoyment after the study controlled for the effects of pre (PE) enjoyment (this was repeated for post-NC, controlled for pre-NC) revealed no statistical difference by level of intention to enroll in post-enjoyment after controlling for pre-enjoyment, $F(1, 63) = .003$, $p = .95$, $\eta^2 < .001$; however, there was for postunit NC after the study controlled for the effects of pre (PE) NC, $F(1, 63) = 5.57$, $p = .021$, $\eta^2 = .081$. Levene's test revealed no violation of the homogeneity of variance assumption for both enjoyment, $F(1, 64) = .648$, $p = .424$, and NC, $F(1, 64) = 2.07$, $p = .155$.

Finally, of the 71 students participating in this study, 66 responded to the postunit qualitative item about their likes and dislikes about the TGfU territorial games unit (fourth study objective). Reasons for not responding to the question included both being absent on the day this item was collected and choosing to abstain from responding to the item. Table 4 provides the main likes and dislikes of the territorial games TGfU unit. Fifty-five (83%) respondents reported something they liked about the TGfU unit. Fourteen students found the games to be fun, with several stating "the games were fun" or, more specifically, "the Frisbee game was fun." As many noted it was "fun to play and be active" during the unit. For example, one respondent stated, "It was good to let the class get active in a fun way," while another highlighted the team and social aspect of the activities as contributing to a fun environment: "We all worked in teams and made it more fun for each other." Students also reported liking how related the games were (e.g., "similar to other games played") and how they progressed (developed) within the lesson, enabling students to "understand new games easier." Students also seemed to enjoy the size of teams and the challenge level of the games. The games were simple to play and allowed for a more appropriate level

Table 4
Student Likes and Dislikes of the Territorial Games Teaching Games for Understanding Unit

Theme	Subtheme
Likes	
Fun	Play and activity
	Games
	Fun in general (nothing specific)
	Social and teams
Games	Related to one another
	Novel
	Nothing specific
	Fun
	Appropriate challenge
	Specific games
	Team games
Active	Nothing specific
	A lot of activity
Skills	Life skills (e.g., problem solving)
	Physical skills
Learning/understanding	Tactics and strategies
	Understanding games
	Learning skills
Discussion	
Affective domain	Interaction with peers
Dislikes	
Boring	Previous experience
	Games
	Nothing specific
	Stopping to discuss
Games	Repetitive
	Confusing or unfamiliar
	Challenge level
	Boring
Prior experience	
Not regular PE or sports	
Activity level	
Learning	

of competition. Students could "play against other people around [their] skill level rather than getting destroyed by the really athletic people in games like soccer." Comments related to affect were also common with most (28.8%) addressing the merits of positive social interactions and opportunities for students to develop physical (3%) and life skills (13.6%) such as "problem solving," "leadership skills," and teamwork (e.g., "I really liked the teamwork"). The learning that occurred during the unit was also a theme (16.7%), with several (10.6%) responses highlighting the enjoyment of learning strategies and tactics (e.g., "how to make space"), applying them in different situations and games across the unit (e.g., "helped you to understand the new games"), and improving their skills ("I got to work on my throw").

There were 31 (46.9%) responses about something students disliked about the TGfU unit. The most common criticism (30.3%) was related to the games or activities being played as being either repetitive (e.g., "I didn't like that they were somewhat repetitive"), boring (e.g., "I liked the games at first, but then after a while it started to get boring and now the games we play are now boring"), confusing and unfamiliar (e.g., "some made no sense" and "I would rather play what everyone knows"), or too challenging (e.g., "I didn't like some of the games either because I didn't understand or they were challenging"). Others, however, declared the games as being too simple (e.g., "I enjoyed some of the games, some just too simple or boring"), which signaled that it was difficult to suit the challenge level of all the students. Some students wanted more physical activity in the lessons (e.g., "We did not get any physical activity out of it" and "I wish there was more playing"), while others reported not enjoying being physically active at all (e.g., "I do not enjoy physical activity in general, so I do not like gym most of the time"). Some students (6.1%) also disliked having to learn during the unit (e.g., "I much prefer just playing sports rather than something that we have to learn, I would rather play what everyone knows"), especially through sedentary questioning ("I didn't like the questions that went along with the games") and discussions (e.g., "I did not really like when we had to stop in the middle of a game to talk about the different elements of the game. I know that it is necessary to know, but it was just a little boring"). Finally, in approximately 20% of responses, students mentioned that

the unit was generally boring (e.g., "Some of the things in this unit were boring and just things I don't really like to do") or failed to teach them anything new (e.g., "I found them a little boring because they were about creating space, getting open, defending and attacking, stuff like that and I play soccer so I already knew about those things and how to do them").

Discussion

The findings pertaining to the four objectives in this study were, first, students had very high levels of enjoyment in PE prior to the TGfU unit and relations between NC and enjoyment and intentions to enroll were higher (and statistically significant) for TGfU than for PE. Second, enjoyment was significantly higher for PE than for the TGfU unit. Third, significantly higher enjoyment for PE than for TGfU was evident in students with higher, not lower, intentions to enroll, and after the study controlled for preunit levels of enjoyment and NC, only postunit NC was significantly higher in students with elevated intentions to enroll. Finally, results revealed that in the TGfU unit, students liked the fun, games, being active, developing life and physical skills, learning and understanding, and being engaged socially in challenging content and activities. Reasons for disliking the TGfU unit were the nature of the games or activities (boring, too much or not enough challenge), the emphasis on learning, insufficient physical activity, and the lack of learning anything new.

The finding of this study that enjoyment was significantly higher for PE than after the TGfU unit is somewhat novel in that enjoyment has often been reported as higher for TGfU than for traditional PE instruction (Alison & Thorpe, 1997; Lodewyk & Bracco, 2019; Mandigo et al., 2008; Morales-Belando, 2018). Light (2003a), however, found that students' enjoyment of TGfU took time because they had to get accustomed to it. For students to acclimate themselves fully to the TGfU experience to better enjoy it, a longer duration of or more TGfU units may be necessary (Harrison et al., 2004). Student qualitative likes and dislikes of the TGfU instructional model in this study generally corroborated research findings such as enjoying the increased gameplay, team-based social interactions, learning and understanding, level of challenge, and opportunities to be physically active (e.g., Morales-Belando, 2018; Mandigo et al., 2008; Wright

et al., 2009). A novel finding in this study was the value students placed on learning new life skills in TGfU compared with regular PE. The prominent dislikes of TGfU in this study also resemble those in other research. These include dislikes of the types of games or activities (e.g., boring or too much or not enough challenge), an overemphasis on learning and underemphasis on physical activity, and a lack of learning anything new. To illustrate, participants in the study by Wright et al. (2009) described not liking the games in their unit or the amount of discussion in TGfU, while others (e.g., Fry et al., 2010; Mandigo et al., 2008) found that some participants reported TGfU as boring often because of a lack of novelty in the content.

Some TGfU-based research may help to explain why enjoyment of TGfU in this study was lower in those with higher intentions to enroll in future PE. Alison and Thorpe (1997) reported that underserved students responded better to TGfU participation than traditional skills-based teaching, whereas Light (2002) found elevated levels of enjoyment of TGfU in more experienced and skilled students (preservice teachers), likely due in part to "their increased maturity" (p. 291). It is possible, therefore, that this sample (especially students who reported higher intentions to enroll) responded less favorably to TGfU because of their lack of familiarity and their level of discomfort with it compared with the enjoyment and success they had experienced in regular PE. Their experience in the TGfU unit might have required them to, for example, pause more frequently to engage in the sociocognitive learning process (i.e., short small-group discussions and problem solving) while giving them more autonomy through choice and input in the game structure. These instructional changes may have compromised their personal views and expectations of how games in PE should be taught and experienced, particularly if the status quo (regular PE) already adequately met their core needs in PE. Kidman and Lombardo (2010) reported that when students enjoy sports and PE, they are inclined to increase their participation in those and in a similar way. We caution intention to enroll in PE could be related to factors beyond TGfU or PE in the form of, for example, not planning to enroll in PE because it does not fit in a course schedule or is not necessary for graduation (Lodewyk & Pybus, 2013).

Another noteworthy finding of this study is that post-TGfU NC was significantly higher in students with elevated intentions to enroll after the study controlled for preunit levels of NC and that this was not evident in enjoyment. In other words, compared with students with lower intentions to enroll, those with higher intentions to enroll may be more prone to lower enjoyment of TGfU than PE while engaging more cognitively in TGfU than PE. There may be some conceptual relationship of this finding to that of Sproule et al. (2011), who reported that learners who participated in a games-based PE setting believed that their decision-making ability in games improved substantially over the intervention, compared with those who had participated in skill-based instruction, who perceived their ability to make decisions decreased. Several related studies reported post-TGfU elevations in indices of cognitive engagement such as NC (Lodewyk, 2015); tactical knowledge (Gubacs-Collins, 2007; Morales-Belando, 2018); reflection, critical thinking, and self-regulation (Richard & Wallian, 2005); and creative thinking, problem solving, and decision making (Butler & McCahan, 2005). The elevated relations between NC and both enjoyment and intentions to enroll in TGfU in this study might also signal that although NC was not significantly different between TGfU and PE overall, its influence during TGfU may be more covert than during traditional instruction in PE through, for example, students' intention to enroll. More research is needed for corroboration of these findings.

To conclude, we highlight the limitations of this study, especially the limited length and scope of the TGfU unit, lower than ideal sample size, marginal alpha reliability for postunit NC, and the use of one item in the measurement of intention to enroll. We welcome similar investigations with a larger sample size to confirm, refute, or add to these findings and recommend that they implement a longer TGfU games unit using other game forms (e.g., striking/fielding or individual/dual games) in a larger and more diverse sample while ensuring more variance in preunit enjoyment of PE. Despite these limitations, this study adds fresh insight into Grade 9 students' like and dislikes of TGfU, differences in enjoyment and NC between PE and TGfU, and differences relative to higher and lower levels of intention to enroll in PE. Noteworthy results include the significantly higher enjoyment for PE than for TGfU and the increased likelihood

that students higher in intentions to enroll enjoy TGfU less than PE yet have higher NC during TGfU than in PE. TGfU may initially be less favorable to students because it could conflict with their personal views and expectations of how games in PE should be taught and experienced. It may be necessary to better provide some explanation, rationale, and evidence for TGfU prior to or during initial implementation of it, especially to those with higher intentions to enroll. It is also important to ensure optimal levels of physical activity, challenge, novelty, and social interactions while avoiding an overemphasis on acquisition of knowledge. Adding some cognitive incentives during TGfU to students less likely to enroll in future PE could also be useful.

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