



A Systematic Literature Review of Group Contingencies Within General Education Classrooms

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Abstract

Research is essential for identifying behavior management procedures as evidence-based and employing these procedures in a classroom is vital to create the optimal environment for students. Group contingencies can be easily implemented across classroom settings as they aim to manage the behavior of a group via operant behavior change procedures. While systematic literature reviews have been conducted on group contingencies, one has not been completed with a focus on elementary through high school general education classrooms. Therefore, this paper extends previous systematic literature reviews focused on preschools (Pokorski et al. *Topics in Early Childhood Special Education*, 36(4), 230–241, 2017), problematic behavior (Maggin et al. *Remedial and Special Education*, 38(6), 353–370, 2017), the good behavior game (Bowman-Perrott et al. *Journal of Positive Behavior Interventions*, 18(3), 180–190, 2016), and school aged children across all academic settings (Little et al. *Behavior Modification*, 39(2), 322–341, 2015) to concentrate on the use of group contingencies in the general education setting. Because (Little et al. *Behavior Modification*, 39(2), 322–341, 2015) conducted a comprehensive review through the year 2010, this paper will focus on the literature base between 2011 and 2021. Articles were obtained via electronic databases and included studies with an independent variable of a group contingency, students in kindergarten through 12th grade general education classrooms, and studies set in any school location. Results yielded 53 articles, which were coded across participant demographics, independent variables, dependent variables, limitations, and future research with IOA collected by a graduate student on 35% of the articles. Results indicate the majority of studies included participants in elementary school, implemented an interdependent group contingency, measured disruptive behavior, and assessed the intervention in the classroom. Findings suggest common limitations within the current literature include generalizability, maintenance, applicability of rewards, and assessment of academic performance. Future research should focus on assessing feasibility of implementation, evaluating long-term effects, and obtaining social validity.

Keywords Group contingencies · General education · Classroom management

Effective classroom management systems are essential for creating an optimal learning environment (Heering & Wilder, 2006), and therefore, it is critical that teachers be equipped with the necessary tools to manage and prevent challenging behaviors in general education classrooms. While the majority of classroom management research has focused on using behavior management interventions with individuals in special education classrooms or those diagnosed with intellectual or learning disabilities (McKissick et al., 2010), public school teachers report that the

occurrence of disruptive behaviors in general education is prevalent (Naylor et al., 2018). This high prevalence of challenging behaviors leads to increased stress and discontent among teachers, ultimately leading to early departures from the field. It was reported that in the USA, half of new teachers resigned from their positions within their first 5 years, with a major reason being high rates of challenging behaviors (Aloe et al., 2014). This concerning statistic highlights the need for more research on classroom management and training for teachers to effectively apply interventions in their classroom.

Research is crucial for designing and employing interventions for general education teachers to easily apply in their classrooms. Group contingencies, which are rules and expectations applied to a group, are often suggested as a classroom

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management contingency due to the relative ease with which they can be implemented and the impact the strategies have across a number of students (Heering & Wilder, 2006). The use of group contingencies within classrooms may be more feasible for one teacher to implement in a classroom up to 30 students than are individualized contingencies (Heering & Wilder, 2006).

Group contingencies are defined as the application of operant behavior procedures to manage the behavior of a group (Litow & Pumroy, 1975). There are three categories of group contingencies: independent, interdependent, and dependent. In an independent group contingency, the same response contingencies are in place for all group members; however, reinforcement is delivered based on individual performance. These interventions are used more often in special education classrooms compared to general education, which is most likely because the performance of one individual does not affect reinforcement for other group members (Litow & Pumroy, 1975).

Within general education classrooms, independent group contingencies have been effective for increasing academic engagement behaviors (Dart et al., 2016), decreasing disruptive behaviors (Lum et al., 2019), and increasing physical activity (Wahl-Alexander et al., 2020). In one study, Dart et al., (2016) used a novel form of an independent group contingency, titled the classroom password, with middle school students to increase academic engagement and decrease disruptive behaviors. During this game, the teacher said the specified word a certain number of times while the students tallied the frequency. Up to five students, of those who scored the correct frequency, were randomly selected to receive the reward at the end of the session. Results demonstrated an increase in academic engagement behavior and decrease in disruptive behavior, with variable data for decreasing off-task behavior. Social validity results indicated that two of the three teachers rated the procedure as acceptable and one teacher agreed with its immediate positive effect. Findings suggest this intervention may be valuable and that additional research is needed to confirm results and increase teacher acceptability.

An interdependent group contingency requires all members to achieve a certain level of performance for the group to receive access to the reinforcer. This type of contingency can help students work together and encourage one another (Helton & Alber-Morgan, 2020). On the other hand, if one or a few students prevent the class from receiving the reinforcer, those students may experience negative social consequences from peers (Helton & Alber-Morgan, 2020). Studies have used interdependent group contingencies to increase homework completion (Chafouleas et al., 2012), frequency of teacher praise (Clair et al., 2018), physical activity during recess (Foote et al., 2017), and on-task behavior (Kamps et al., 2015). Research has also evaluated interdependent

group contingencies for decreasing disruptive behavior (Lee et al., 2017) and off-task behavior (Ling et al., 2011).

One form of an interdependent group contingency that has received attention in the literature is the good behavior game (GBG), in which the class is separated into teams, rules are enforced for all students, and points are delivered for either appropriate behaviors or challenging behaviors (Pennington & McComas, 2017). A potential obstacle in the design of this system is determining a reinforcer that is preferred by all students (Lo & Cartledge, 2004). Methods to increase motivation include conducting frequent preference assessments, varying the reinforcer often, and using a mystery box (Silva & Wiskow, 2020). GBG has presented positive results for decreasing challenging behaviors including disruptive behavior (Bohan et al., 2021; Dadakhodjaeva et al., 2020), off-task behavior (Hernan et al., 2019), and out of seat behavior (Elswick et al., 2016). Studies have also demonstrated success with increasing teacher attention (Donaldson et al., 2015), teacher's use of behavior specific praise (Lastrapes et al., 2018), academic engagement behavior (Lynne et al., 2017), reading performance (Weis et al., 2015), and on-task behavior (Pennington & McComas, 2017).

A dependent group contingency delivers reinforcement to the entire group based on the performance of one or more selected individuals in the group (Litow & Pumroy, 1975). A potential undesirable outcome of this contingency is negative social consequences from peers to the selected individual (Heering & Wilder, 2006). Alternatively, this can be a benefit as it allows one student or a small group of students to receive appreciation from peers if reinforcers are earned. Due to this potential limitation, the individual's anonymity should be maintained until the contingency is met (Helton & Alber-Morgan, 2020). Another possibility is for the teacher to target several behaviors simultaneously to reduce the likelihood that the selected individual will be identified prematurely (Helton & Alber-Morgan, 2020).

Dependent group contingencies have been used for a variety of targets including reducing disruptive behavior (Deshais et al., 2018), increasing on-task behavior (Bulla & Frieder, 2018), and increasing engagement in physical activities (Vidoni et al., 2012). One study successfully evaluated the use of a randomized dependent group contingency for reducing disruptive behaviors during hallway transitions with first grade students in a public elementary school (Deshais et al., 2018). A dependent group contingency may also be applicable in physical education classes as Vidoni et al., (2012) successfully increased students' heart rates and physical activity.

There are numerous advantages to using group contingencies in classrooms to manage challenging behaviors and increase desirable behaviors. These systems are also economical and practical as it is possible for one teacher to implement. Group contingencies are also flexible as they allow teachers to modify

the intervention to fit the classroom needs, address the behavior of one student or the entire class, and be used alone or in combination with additional interventions. These contingencies can also accommodate the varying needs and abilities of students in general education classrooms. While the recent research in school settings demonstrates their effectiveness for classroom management, generalization is a key component to extending the use of these strategies as classroom or school wide interventions. Further research is vital for determining how group contingencies can optimally be applied within general education classrooms and generalized across students and teachers.

Purpose

The results of previous literature reviews (Bowman-Perrott et al., 2016; Little et al., 2015; Maggin et al., 2017; Pokorski et al., 2017) suggest group contingencies are an appropriate classroom management strategy for modifying behaviors on a group level. An updated review is necessary to evaluate how group contingencies have been implemented in general education classrooms, specifically the targeted behaviors, ages of students, social validity, and identified areas for future research. The purpose of the current paper is to explore the research on group contingencies within general education classroom settings. The evaluation of these studies aims to identify the effectiveness of group contingencies, the limitations within the current literature, and directions for future research. Previous literature reviews have been conducted on various uses of group contingencies including studies set in preschools (Pokorski et al., 2017), those with students who present with challenging behaviors (Maggin et al., 2017), and implementation of the good behavior game (Bowman-Perrott et al., 2016). Little et al., (2015) reviewed the application of group contingencies with school aged children from 1980 to 2010 across various settings and included 50 studies. There has yet to be a literature review to focus solely on the application of group contingencies in general education classrooms. Given the substantial amount of research in the past 10 years, the use of group contingencies within general education settings needs an updated comprehensive review to synthesize the current research and evaluate trends in the literature.

Method

Selection Criteria

A review of empirical literature on group contingencies within educational settings was conducted through the identification and evaluation of single-subject studies. A search of the literature was conducted through electronic databases, including Wiley Online Library Database,

ProQuest Central, and SAGE Online. A combination of the following terms was used: group contingency, general education, school aged children, independent group contingency, interdependent group contingency, dependent group contingency. Inclusion criteria consisted of studies with an independent variable of a group contingency or a group contingency within the intervention package, single subject design with at least one participant, students in kindergarten through 12th grade general education classrooms, students receiving special education within a general education classroom, and studies set in any school location, including academic classrooms, non-academic classes (i.e., physical education class, art class), and hallways. Studies were excluded if they were conducted in an alternative school, resource classroom, small group instruction (i.e., students pulled out of the classroom), special education classroom, self-contained classroom, or if adult participants were included. Additional parameters included the necessity for publication in peer-reviewed journals, publication date between 2011 and 2021, and publication in the English language. The original search yielded 24,388 articles. A review of the title and abstracts resulted in 107 studies meeting criteria for inclusion in this review. Articles were then further screened by reading the methods section for final selection yielding 53 studies in total.

Coding

For each study, the participants, methods, results, limitations, and future research directions were coded to synthesize this information. Variables were selected, operationally defined, and coded by the first author. Results were then summarized as the percentage of articles by category and displayed in Table 1. Interobserver agreement data were collected for 35% of the included articles by one additional graduate student. This observer was trained by the first author on how to code each variable including how to calculate effect size and how to report results on the coding form. IOA results demonstrate 98% agreement across all coded variables.

Participants and Setting

Participants of the 53 studies were coded by gender, number, race/ethnicity, and whether any participants were receiving special education services. The setting of the study was coded to identify whether the intervention was implemented in an academic classroom, non-academic classroom (e.g., physical education, art classroom), an alternative location within the school (e.g., recess, hallways), and the number classrooms involved in the study.

Table 1 Participants and setting

	Coded variable	Code and definition	% of articles	
Participant	Grade	Defined as all or a portion of participants in listed grade		
		Kindergarten	19%	
		1st grade	25%	
		2nd grade	6%	
		3rd grade	21%	
		4th grade	8%	
		5th grade	4%	
		6th grade	8%	
		7th grade	9%	
		8th grade	8%	
		9th grade	8%	
		10th grade	2%	
		11th grade	2%	
	12th grade	2%		
	Gender	Male	Male	2%
			<i>All male participants</i>	
		Female	Female	0%
			<i>All female participants</i>	
		Coed	<i>Male and female participants</i>	81%
	Not specified	<i>The authors did not report on gender</i>	17%	
Race/ethnicity	Race/ethnicity specified	<i>Race/ethnicity specified</i>	64%	
		<i>Percentages of specific race/ethnicity reported on all participants</i>		
	Race/ethnicity generally reported	<i>Percentages of race/ethnicity categories reported (e.g., percentage minority participants)</i>	11%	
	Not specified	<i>Authors did not report on race/ethnicity</i>	25%	
Diagnoses	All students neurotypical		13%	
	At least one student with ASD		4%	
	At least one student with learning disability		8%	
	At least one student receiving SPED services		11%	
	At least one student with other health impairment		6%	
	At least one student with EBD		8%	
	At least one student with ADHD		4%	
	At least one student identified as other		8%	
	Not specified		51%	
Setting	Locations	The identified environment where the study was conducted		
		Gen Ed classroom	81%	
		Physical education	8%	
		Recess	4%	
		Hallway	2%	
		Art class	4%	
		Not specified	2%	

Studies were coded across participant demographics including gender, grade, race/ethnicity, and diagnosis. There may be overlap in that studies included participants from different categories. The settings were defined as the location the duration of the study occurred

Independent Variable

The independent variable was coded by type of group contingency (dependent, independent, interdependent, or comparison), and whether there was an intervention in addition to the group contingency. The majority of studies clearly specified the type of group contingencies, but for any that did not, an inference was made based on the description of the intervention provided.

Dependent Variable

Each study's dependent variables were coded by the following categories: on-task behavior, off-task behavior, academic engagement behavior, disruptive behavior, average number of steps, heart rates, teacher statements, academic performance, or other. The other category included variables such as transitioning between classrooms, intervention acceptability, teacher accuracy with data collection, percentage of potential points earned, and mobile device presence.

Findings

To provide information on the magnitude of the effect of the intervention on the dependent variable, effect sizes were calculated on all dependent variables and participants in the study. Nonoverlap of all pairs (NAP) is an index used to determine the effect between phases by comparing all data points in baseline to all data points in intervention (Parker & Vannest, 2009). The amount of change between baseline and intervention can be measured by the extent to which baseline and intervention data points do not overlap, which can be quantified by NAP values (Parker & Vannest, 2009). If the study reported NAP values as part of their results, those scores were used for coding. For the remaining studies that did not report NAP values, data were extracted using the digitization program, WebPlotDigitizer (Moeyaert et al., 2016), and inserted into the NAP calculator. Moeyaert et al., (2016) evaluated the usability of data extraction programs and found that WebPlotDigitizer was the best selection based on usability, time to obtain data, and cost.

Limitations

The most frequent limitations as reported by the author were coded across all studies. These limitations included short implementation period, limited generalizability, applicability of rewards, multiple components, lack of maintenance, small sample size, low or minimal IOA and treatment integrity, function of behavior not identified, reinforcers may not function as reinforcers, no individuals

data collection, procedural deviations from research methodology, constant researcher presence, minimal social validity, time constraints, academic performance not assessed, or other (e.g., teacher withdrawal, no preference assessment, possibility of observer bias, staff or student absences).

Future Research

Directions for future research as reported by the authors were coded across studies. The most common areas were defined and coded as assessing social validity, conducting a component analysis, analyzing effects on individual students, assessing generalization, evaluating long-term effects, assessing academic performance, conducting preference assessments, assessing feasibility on teacher's part, adjusting the schedule of reinforcement, assessing the intervention without outside support, and other (e.g., blind research assistants, frequency with which intervention is implemented, economical prize rewards).

Results

Participants and Setting

The majority studies included participants in kindergarten through third grade with 19% of studies in kindergarten, 25% in first grade, 6% for second grade, and 21% in third grade. In regard to gender, 2% of studies used only male students, 81% were coeducational, and 17% of studies did not specify gender. Race or ethnicity data were reported in 75% of studies with 64% specifying the percentage of students per race/ethnicity and 11% categorized students generally. Studies also varied with respect to number of students and classrooms as 25% included one classroom, 49% assessed multiple classrooms, 9% included one classroom with target students, 15% included multiple classrooms and target students, while 2% of studies collected data only on target students. Students also varied in diagnoses with 13% all typical development, 4% with at least one student with autism, 8% with at least one student with a learning disability, 11% with at least one student receiving special education, 6% with least one student with other health impairment, 8% with at least one student with EBD, 4% with at least one student with ADHD, 8% categorized as other, and 51% studies did not specify. The settings of the studies were less varied with 2% in the hallway of the school, 4% in art class, 4% in recess, 8% in physical education classes, 81% in the classroom, and 2% did not specify the location.

Independent Variables

While all three types of group contingencies are expressed in the literature, 80% used interdependent, 6% used an independent, 6% used a dependent, and 9% compared at least two group contingencies. Of the interdependent studies, 36% of studies implemented the good behavior

game and 2% used the caterpillar game (a novel modification of an interdependent group contingency) (Table 2).

Dependent Variables

The dependent variables assessed in each study varied somewhat with 58% measuring disruptive behavior, 30%

Table 2 Methodological variables

Coded variable	Code and definition	% of articles	
Dependent variable	Each variable was termed by the author with a provided operational definition		
	Disruptive behavior <i>Included behaviors such as out of seat behavior, student talk out, inappropriate vocalizations, manipulation of objects that disrupted the class, throwing materials</i>	58%	
	Academic engagement behavior <i>Included behaviors such as preparedness, compliance with assigned seatwork, attending to teacher, materials, and/or peers, engaging in appropriate classroom discussions</i>	30%	
	Off-task behavior <i>Included behaviors such as mobile device presence, not attending to the task without being disruptive, not responding when called by teacher, obtaining supplies without permission</i>	11%	
	On-task behavior <i>Included behaviors such as attending to task at hand, answering questions, raising one's hand, writing on a worksheet, taking notes, orienting body towards lecture</i>	23%	
	Average number of steps <i>Number of steps for each participant as recorded on a pedometer</i>	9%	
	Heart rates <i>Heart rates of each participant as recorded by the Polar E 600 heart rate monitor</i>	2%	
	Academic performance <i>Included behaviors such as addition fluency, reading achievement, math achievement, writing output</i>	8%	
	Teacher statements <i>Includes general praise and behavior specific praise delivered by teacher</i>	11%	
	Other <i>Study included a dependent variable not listed above such as transitioning between classrooms, intervention acceptability, teacher accuracy with data collection</i>	6%	
	Independent variable	The independent variable was labeled by the author	
		Independent group contingency	6%
		Dependent group contingency	6%
Interdependent group contingency		42%	
Good behavior game		36%	
Caterpillar game		2%	
Comparison of two contingencies		9%	
Secondary independent variable		A second independent variable was identified by the author and a description was provided	
	Self-management	6%	
	Tootling	6%	
	Adult interaction	2%	
	Antecedent—clear box	2%	
	CW-FIT	4%	
	Positive peer posting	2%	
	Public posting	2%	
	Social skill instruction	2%	
None	77%		

The independent and dependent variables were identified and defined by the authors of each study. Definitions for the dependent variables are listed in italics

measuring academic engagement behavior, 23% assessing on-task behavior, 11% including teacher statements, and 9% collecting the average number of steps taken.

Findings

To synthesize the results of each study, NAP scores were calculated for each dependent variable and the effect was categorized as weak, moderate, or strong. Scores between 0 and 0.65 are considered weak effects, scores of 0.66–0.92 are considered moderate effects, and scores of 0.93–1.0 are

considered strong effects (Parker & Vannest, 2009). Of the 53 studies, 68% demonstrated a strong effect for at least one dependent variable, 43% demonstrated a moderate effect for at least one dependent variable, and 6% demonstrated a weak effect for at least one dependent variable (Table 3).

Limitations

The limitations as identified by the authors are also widespread with 28% mentioning limited generalizability, 25% indicating a small sample size, 15% reporting not collecting individual data,

Table 3 Results and discussion variables

Coded variable	Code and definition	% of articles
Findings	Strong NAP score: 0.93–1.0	68%
	Moderate NAP score 0.66–0.92	43%
	Weak NAP score: 0.00–0.65	6%
Limitations	Short implementation period <i>20 min or fewer per implantation period</i>	8%
	Limited generalizability <i>As reported by author</i>	28%
	Applicability of rewards <i>Includes cost to school, teacher obtaining reinforcers</i>	8%
	Multiple components <i>If more than one intervention was used and unable to determine which component created effect</i>	11%
	No maintenance <i>As reported by author</i>	13%
	Small sample size <i>As reported by author</i>	25%
	Low or minimal treatment integrity <i>As reported by author</i>	15%
	Low or minimal IOA <i>As reported by author</i>	8%
	Function of behavior not identified <i>As reported by author</i>	8%
	Reinforcer may not function as reinforcer <i>As reported by author</i>	8%
	No individual data collection <i>As reported by author</i>	15%
	Procedural deviations from research methodology <i>Includes any occurrence of teacher modifying intervention without consulting with researcher or teacher deciding to implement a phase early</i>	8%
	Constant researcher presence <i>Researcher present for all or majority of sessions, researcher implemented intervention, researcher heavily involved in preparations</i>	6%
	Minimal social validity <i>Includes missing information on feasibility, social validity not collected from participants; missing information or missing group of people that could have been helpful, and as reported by authors</i>	13%
	Time constraints <i>Includes if or one or more groups/classrooms did not complete a phase, end of school year approached prior to completion; new system being implemented within school</i>	13%
	Academic performance not assessed <i>As reported by author</i>	8%
	Other <i>Includes teacher bias, lack of preference assessments, absences</i>	15%

Table 3 (continued)

Coded variable	Code and definition	% of articles
Identified future research directions	Assess social validity <i>Includes one or more social validity assessments, teacher preferences, teacher acceptability, and student preference</i>	15%
	Component analysis <i>As reported by author</i>	15%
	Effects on target students <i>Includes collecting individual data on students</i>	9%
	Assess generalization <i>Includes across settings, participants, dependent variables</i>	40%
	Additional or long-term effects <i>Includes longitudinal research, data collections before and after intervention; maintenance data collection</i>	11%
	Assess academic performance <i>As reported by author</i>	9%
	Preference assessments <i>As reported by author</i>	6%
	Assess feasibility on part of teacher <i>Includes technology for data collection; implementation of one or more parts of the intervention through technology; assessment on how to reduce response effort</i>	4%
	Adjust schedule of reinforcement <i>Includes assessment of different schedules of reinforcements, thinning the schedule of reinforcement, and delivery of partial rewards</i>	6%
	Assess the intervention without outside support <i>Including training teachers to implement instead of researcher and assessing various training methods</i>	8%
Other <i>Includes use of blind research assistants, economical prize rewards, frequency with which intervention is implemented</i>	8%	

All limitations and future research directions were identified by the authors of each study. NAP scores were calculated and categorized as weak if the score was 0.0–0.65, moderate for scores 0.66–0.92, and strong if the score was 0.92–1.0 (Parker & Vannest, 2009)

15% stating low or minimal treatment integrity data, 13% reporting minimal social validity, 13% identifying time constraints, 8% describing low or minimal IOA data, 8% acknowledging the reinforcer delivered may not have truly functioned as reinforcers, 11% indicating there were multiple components to the intervention, 13% reporting maintenance data were not collected, 8% indicating there may have been procedural deviations from the research methodology, 8% suggesting the function of the behavior was not identified, 8% mentioning the applicability of rewards may be limited, 6% discussing the researcher presence, and 8% considering not assessing academic performance a limitation.

Identified Directions for Future Research

Authors of the included studies also mentioned numerous directions for future research. Of the 53 studies, 40% suggested generalization assessments, 15% suggested component analyses, 15% recommended assessment of social validity, 11% indicated the need for evaluating additional or long-term effects of the intervention, 9% suggested academic performance be measured, 9% mentioned the need for measuring the effect on

target students, 6% indicated the schedule of reinforcement be adjusted, and 4% mentioned the need for assessing feasibility on the part of the teacher, and 8% suggested the intervention be implemented without outside support.

Discussion

This review evaluated the use of group contingencies from 2011 to 2021 and identified 53 studies that met inclusionary criteria. The settings were narrowed down to any general education classroom within the school, including academic and non-academic classrooms. Overall, results of this literature demonstrate the use of group contingencies across grades, behaviors, and school locations. While the majority of studies included elementary aged students, research supports their use in grades from kindergarten through 12th grade. Interdependent group contingencies are also the most commonly implemented, suggesting higher feasibility compared to dependent and independent. Additionally, the results of this review highlight the

limitations that have been addressed, limitations that still exist, and directions for future research.

Participants and Setting

A common limitation and area for future research was the use of a small sample size and the need to address a range of ages. While each study used a specific age range, the effectiveness of this intervention has been demonstrated across ages within the literature. While 25% discussed small sample size as a limitation and 28% mentioned limited generalizability, classrooms from kindergarten to 12th grade are represented in the literature, suggesting this limitation has been addressed. However, the majority of studies (71%) used participants in kindergarten through third grade. Future research should focus on evaluating group contingencies with upper elementary, middle school, and high school students.

Based on the literature, a current limitation is the application of group contingencies to general education classrooms also consisting of students with developmental or learning disabilities. While 51% of studies did not specify the development of the students, 13% included students all of typical development and 11% included at least one student receiving special education services. More research is warranted on the effectiveness of the intervention with students with disabilities in a general education classroom.

Findings of this literature review demonstrate the limited number of studies that took place in non-academic classrooms. The majority of studies were set in the student's academic classroom even though classroom management strategies are still necessary in other settings within the school. Students who receive special education are more likely to attend general education non-academic classes than academic classes, suggesting a possible need for classroom management strategies in these classrooms. Of the studies included in this review, two studies took place in art class, four studies were set in a physical education class, and two studies occurred during recess. Future research is necessary to determine if and how group contingencies can be applied in these types of settings to decrease challenging behavior and increase desirable behaviors.

Dependent Variables

The majority of studies (58%) included disruptive behavior as at least one of the dependent variables. Other common dependent variables include academic engagement behavior, off-task behavior, and on-task behavior. Only four studies assessed academic performance, which should be addressed in future research. A primary purpose for decreasing off-task behaviors is to optimize instructional time and

facilitate learning. While measuring off-task behavior may be an important indicator, decreasing off-task behavior may not directly translate to improved academic performance (Heering & Wilder, 2006). Perhaps additional interventions should be used in conjunction with group contingencies to increase appropriate classroom behaviors and create academic success.

Interventions

Overall, the most common group contingency was the interdependent with 80% of studies using some form of an interdependent group contingency. Of those 80%, 36% used the good behavior game and 2% used the caterpillar game. The quantity of studies using the good behavior game and their results indicate its feasibility and effectiveness. Of these studies, only three mentioned minimal or low social validity, signifying teacher and student acceptance of this intervention. Additionally, only one study included low or minimal treatment integrity and two studies included the need for researcher presence throughout implementation as a limitation. The few studies that included minimal social validity or treatment integrity as limitations suggest the good behavior game may be easily implemented by a classroom teacher and rated favorably by teachers and students.

The majority of these studies used participants in kindergarten (7) and first grade (5), although grades through eleventh are represented in the literature. Similarly, the majority of studies assessed academic engagement behavior (7) and disruptive behavior (13) as at least one of their dependent variables. Off-task behavior, on-task behavior, and frequency of teacher statements were each represented in two studies and academic behavior was only measured in one study. Future studies should measure additional variables to determine the generalizability of the good behavior game.

Another limitation within the current literature is minimal studies conducted with upper elementary, middle, and high school students. An advantage of the good behavior game is the ability to modify procedures to meet the needs of the learners (Kleinman & Saigh, 2011). The delivery of rules and terminology used should be altered based on the age and population of the classroom. Future research should explore the good behavior game with older students to ascertain appropriate modifications of the intervention. Future research could also compare the number of teams in which the class is divided while playing the good behavior game. While the majority of research has used two teams (Fallon et al., 2020; Lynne et al., 2017; Pennington & McComas, 2017), a comparison study to determine the optimal number of teams could be beneficial.

There were significantly fewer studies that used an independent or dependent group contingency with three studies of each represented in this review, implying these are

potentially less feasible than interdependent. Research has suggested potential obstacles when designing dependent group contingencies which may contribute to the limited number of studies. A dependent group contingency delivers reinforcement to the entire group based on the performance of one or more selected individuals in the group. A potential undesirable outcome of this contingency is negative social consequences from peers to the selected individual; however, this limitation can be minimized by maintaining the individual's anonymity (Heering & Wilder, 2006).

Another limitation within dependent group contingencies is the potential for reinforcing disruptive behavior (Bulla & Frieder, 2018). Bulla & Frieder, (2018) discussed the possibility that students may be less likely to engage in the appropriate classroom behaviors if their team earns a reward despite some students engaging in disruptive behavior. In this study, one student was selected randomly from each team yielding a low probability for a student being selected and coming into contact with the reinforcement contingency. Due to this implementation, a slow treatment effect was observed. A possible solution could be to select students who exhibit higher rates of disruptive behaviors compared to students who are engaging in desirable behaviors.

Additionally, there may be ethical concerns with dependent group contingencies including negative peer pressure towards the target student if criteria is not met, unwanted peer attention towards the target student if the criteria is met, unachievable criteria for some students if using class average, desire for target student to sabotage peers, and lack of prerequisite skills in the target students' repertoires (Vidoni et al., 2012). Based on these concerns, caution should be taken when creating this type of intervention and individual skills of the students need to be assessed to determine the appropriate performance criteria and the potential for negative social consequences.

Two studies that implemented independent group contingencies mentioned minimal teacher acceptability of the procedures or reinforcement schedule (Dart et al., 2016; Lum et al., 2019). Independent group contingencies require that students earn rewards based on independent performance. Dart et al., (2016) reported low acceptability of the intervention by the classroom teachers, even though data represented a decrease in off-task behavior. Qualitative feedback from teachers regarding potential modifications to the intervention could be beneficial for creating a more feasible procedure. Another possibility for low teacher acceptability ratings is the delivery of reinforcement including the time and cost to obtain the rewards (Lum et al., 2019). Rewards in the form of bonus points and homework passes were also offered; however, teachers expressed concerns that these would artificially inflate the students' grades (Lum et al., 2019).

It is also worth noting that all three studies that implemented an independent group contingency used participants

in middle (Dart et al., 2016; Wahl-Alexander et al., 2020) or high school (Lum et al., 2019). Generalization of the effectiveness of this type of contingency has not been demonstrated across grades, suggesting more research is necessary for determining if an independent group contingency is more accepted by elementary school teachers.

Identified Directions for Future Research

Based on the current literature, many of the limitations discussed have been addressed in other studies including generalization across populations and settings, individual data collection, and limited number of participants. Future research should address the remaining limitations which include determining procedures that do not require the researcher to be present for the duration of implementation, measuring academic performance as an additional dependent variable, conducting follow-up phases, and assessing methods to increase feasibility.

Future researchers may also consider the method for collecting social validity data. Collecting data on the continued use of the interventions may be more indicative of teachers' opinions and acceptability compared to a standard questionnaire (Wahl et al., 2016). While in one study social validity results reported high teacher acceptability, follow-up sessions indicated teachers discontinued the use of the good behavior game (Wahl et al., 2016). Treatment integrity data also needs to be included in future research to ensure classroom teachers are able to implement procedures accordingly. Acceptable rates of treatment integrity are essential to the success and long-term use of an intervention (Lee et al., 2017). Of the studies included, 15% reported low or minimal treatment integrity, which is a concern for generalizability and replication of results. Similarly, 8% of studies reported the classroom teacher deviated from the method and 6% of studies reported the need for the researcher to be present for the duration of implementation. Future research on training teachers efficiently is necessary to ensure successful implementation with high treatment fidelity without the need for outside individuals.

An important direction for future research is to continue developing the most feasible strategies for implementing group contingencies. There is little research that takes advantage of technology for implementing classroom management strategies. Lynne et al., (2017) discussed how electronic devices have received little attention, but should be evaluated more as they could increase the ease with which teachers implement group contingencies. The use of the latest electronic devices, such as iPads and smartboards, as vehicles for implementing group contingencies should be explored. Elswick et al., (2016) compared paper and pencil data collection to computer-based data collection when implementing the good behavior game. Results

demonstrated that teachers collected more accurate data with the computer-based method compared to the data collected by hand. These findings further demonstrate the need for more research with technology and group contingencies. Additional research can determine the most efficient and feasible means of implementation to create the optimal learning environment for all students.

Conclusion

The effectiveness and practicality of group contingencies on managing behaviors in general education classrooms has been demonstrated in the current research. The results of this review further demonstrate that group contingencies are an evidence-based practice that has been successfully implemented across multiple participants, general education settings, and dependent variables. One limitation of this review is the confined setting and population parameters as general education classrooms was the focus. Studies that implemented these procedures in other settings such as special education classes, alternative schools, employment settings, and residential settings were excluded. A second limitation is the time frame as this review only included studies published from 2011 to 2021, and therefore the history of applications of group contingencies within general education is not covered. Based on these limitations, findings cannot be generalized to other settings and only provide clinical implications for use of group contingencies in general education settings from kindergarten through 12th grade. Future research should continue to evaluate group contingencies across various settings and populations to generalize these findings and expand the use of these procedures. The evidence supports the use of group contingencies to modify behavior in the classroom and additional research can determine the most successful and feasible means of implementation. When educators employ evidence-based practices, students will benefit from an enhanced learning environment.

There are several implications of this review that can be useful for teachers and administrators. Target populations included students in general education classrooms in kindergarten through 12th grade, suggesting educators of these grades may be able to apply these interventions to their classrooms. Similarly, several common challenging behaviors were also identified that may be applicable for other classrooms. Results of this review synthesized the settings and for what types of challenging behaviors group contingencies have been effective. Teachers and administrators can review these results and use the outlined evidence-based interventions in their classrooms of similar needs. Due to the occurrence of challenging behaviors in all classrooms, it is important that teachers have access to behavior supports and classroom management systems. The increased

use of classroom management systems will assist educators in creating the optimal learning environment that supports the students' needs and fosters their success.

Declarations

Competing Interests The authors declare no competing interests.

References

- Aloe, A. M., Shisler, S. M., Norris, B. D., Nickerson, A. B., & Rinker, T. W. (2014). A multivariate meta-analysis of student misbehavior and teacher burnout. *Educational Research Review, 12*, 30–44. <https://doi.org/10.1016/j.edurev.2014.05.003>
- Bohan, C., Smyth, S., & McDowell, C. (2021). An evaluation of the caught being good game with an adolescent student population. *Journal of Positive Behavior Interventions, 23*(1), 42–52. <https://doi.org/10.1177/1098300720928455>
- Bowman-Perrott, L., Burke, M. D., Zaini, S., Zhang, N., & Vannest, K. (2016). Promoting positive behavior using the good behavior game: A meta-analysis of single-case Research. *Journal of Positive Behavior Interventions, 18*(3), 180–190. <https://doi.org/10.1177/1098300715592355>
- Bulla, A. J., & Frieder, J. E. S. (2018). Self-management as a class-wide intervention: An evaluation of the “Self & Match” system embedded within a dependent group contingency. *Psychology in the School, 55*(3), 305–322. <https://doi.org/10.1002/pits.22109>
- Caldarella, P., Wills, H. P., Anderson, D. H., & Williams, L. (2019). Managing student behavior in the middle grades using class-wide function-related intervention teams. *Research in Middle Level Education, 42*(7), 1–15. <https://doi.org/10.1080/19404476.2019.1654799>
- Chaffee, R. K., Briesch, A. M., Volpe, R. J., Johnson, A. H., & Dudley, L. (2020). Effects of a class-wide positive peer reporting intervention on middle school student behavior. *Behavioral Disorders, 45*(4), 224–237. <https://doi.org/10.1177/0198742919881112>
- Chafouleas, S. M., Hagermoser Sanetti, L. M., Jaffery, R., & Fallon, L. M. (2012). An evaluation of a class-wide intervention package involving self-management and a group contingency on classroom behavior of middle school students. *Journal of Behavioral Education, 21*(1), 34–57. <https://doi.org/10.1007/s10864-011-9135-8>
- Clair, E. B., Bahr, M. W., Quach, H. L., & LeDuc, J. D. (2018). The positive plus program: Affirmative classroom management to improve student behavior. *Behavioral Interventions, 33*(3), 221–236. <https://doi.org/10.1002/bin.1632>
- Dadakhodjaeva, K., Radley, K. C., Tingstrom, D. H., Dufrene, B. A., & Dart, E. H. (2020). Effects of daily and reduced frequency implementation of the good behavior game in kindergarten classrooms. *Behavior Modification, 44*(4), 471–495. <https://doi.org/10.1177/0145445519826528>
- Dart, E. H., Radley, K. C., Battaglia, A. A., Dadakhodjaeva, K., Bates, K. E., & Wright, S. J. (2016). The classroom password: A class-wide intervention to increase academic engagement. *Psychology in the Schools, 53*(4), 416–431. <https://doi.org/10.1002/pits.21911>
- Deshais, M. A., Fisher, A. B., & Kahng, S. (2018). A preliminary investigation of a randomized dependent group contingency for hallway transitions. *Education & Treatment of Children, 41*(1), 49–63. <https://doi.org/10.1353/etc.2018.0002>
- Deshais, M. A., Fisher, A. B., & Kahng, S. (2019). A comparison of group contingencies on academic compliance: Group

- contingencies. *Journal of Applied Behavior Analysis*, 52(1), 116–131. <https://doi.org/10.1002/jaba.505>
- Donaldson, J. M., Vollmer, T. R., Krous, T., Downs, S., & Berard, K. P. (2011). An evaluation of the good behavior game in kindergarten classrooms. *Journal of Applied Behavior Analysis*, 44(3), 605–609.
- Donaldson, J. M., Wiskow, K. M., & Soto, P. L. (2015). Immediate and distal effects of the good behavior game. *Journal of Applied Behavior Analysis*, 48, 685–689.
- Donaldson, J. M., Fisher, A. B., & Kahng, S. (2017). Effects of the good behavior game on individual student behavior. *Behavior Analysis: Research and Practice*, 17(3), 207–216. <https://doi.org/10.1037/bar0000016>
- Donaldson, J. M., Matter, A. L., & Wiskow, K. M. (2018). Feasibility of and teacher preference for student-led implementation of the good behavior game in early elementary classrooms. *Journal of Applied Behavior Analysis*, 51(1), 118–129. <https://doi.org/10.1002/jaba.432>
- Eaves, A. E., Radley, K. C., Dufrene, B. A., Olmi, D. J., & Bernard, L. E. (2020). A comparison of two group contingencies on teachers' use of behavior-specific praise. *Journal of Behavioral Education*. <https://doi.org/10.1007/s10864-020-09366-6>
- Elswick, S., Casey, L. B., Zanskas, S., Black, T., & Schnell, R. (2016). Effective data collection modalities utilized in monitoring the good behavior game: Technology-based data collection versus hand collected data. *Computers in Human Behavior*, 54, 1580169. <https://doi.org/10.1016/j.chb.2015.07.059>
- Ennis, C. R., Cho Blair, K.-S., & George, H. P. (2016). An evaluation of group contingency interventions: The role of teacher preference. *Journal of Positive Behavior Interventions*, 18(1), 17–28. <https://doi.org/10.1177/1098300715577663>
- Fallon, L. M., Marcotte, A. M., & Ferron, J. M. (2020). Measuring academic output during the good behavior game: A single case design study. *Journal of Positive Behavior Interventions*, 22(4), 246–258. <https://doi.org/10.1177/1098300719872778>
- Floress, M. T., Rock, A. L., & Hailemariam, A. (2017). The caterpillar game: A classroom management system: The caterpillar game. *Psychology in the Schools*, 54(4), 385–403. <https://doi.org/10.1002/pits.22000>
- Foote, C., Bray, M. A., Kehle, T. J., VanHeest, J. L., Gelbar, N. W., Byer-Alcorace, G., Maykel, C., & DeBiase, E. (2017). Interdependent group contingency to promote physical activity in children. *Canadian Journal of School Psychology*, 32(2), 144–161. <https://doi.org/10.1177/0829573516644901>
- Ford, W. B., Radley, K. C., Tingstrom, D. H., & Dufrene, B. A. (2020). Efficacy of a no-team version of the good behavior game in high school classrooms. *Journal of Positive Behavior Interventions*, 22(3), 181–190. <https://doi.org/10.1177/1098300719890059>
- Galbraith, L. A., & Normand, M. P. (2017). Step it up! Using the good behavior game to increase physical activity with elementary school students at recess. *Journal of Applied Behavior Analysis*, 50(4), 856–860. <https://doi.org/10.1002/jaba.402>
- Hansen, B. D., Caldarella, P., Williams, L., & Wills, H. P. (2017). Managing student behavior in dual immersion classrooms: A study of class-wide function-related intervention teams. *Behavior Modification*, 41(5), 626–646. <https://doi.org/10.1177/0145445517698418>
- Hartman, K., & Gresham, F. (2016). Differential effectiveness of interdependent and dependent group contingencies in reducing disruptive classroom behavior. *Journal of Applied School Psychology*, 32(1), 1–23. <https://doi.org/10.1080/15377903.2015.1056922>
- Hearing, P. W., & Wilder, D. A. (2006). The use of dependent group contingencies to increase on-task behavior in two general education classrooms. *Education and Treatment of Children with Developmental Disabilities*, 29(3), 459–468.
- Helton, M. R., & Alber-Morgan, S. R. (2020). Improving young children's behavior with games: Group contingency approaches for managing elementary-classroom settings. *Young Exceptional Children*, 23(1), 24–35. <https://doi.org/10.1177/1096250618798340>
- Hernan, C. J., Collins, T. A., Morrison, J. Q., & Kroeger, S. D. (2019). Decreasing inappropriate use of mobile devices in urban high school classrooms: Comparing an antecedent intervention with and without the good behavior same. *Behavior Modification*, 43(3), 439–463. <https://doi.org/10.1177/0145445518764343>
- Hirsch, S. E., Healy, S., Judge, J. P., & Lloyd, J. W. (2016). Effects of an interdependent group contingency on engagement in physical education. *Journal of Applied Behavior Analysis*, 49(4), 975–979. <https://doi.org/10.1002/jaba.328>
- Kamps, D., Wills, H. P., Heitzman-Powell, L., Laylin, J., Szoke, C., Petrillo, T., & Culey, A. (2011). Class-wide function-related intervention teams: Effects of group contingency programs in urban classrooms. *Journal of Positive Behavior Interventions*, 13(3), 154–167.
- Kamps, D., Conklin, C., & Wills, H. (2015). Use of self-management with the CW-FIT group contingency program. *Education & Treatment of Children*, 38(1), 1–32. <https://doi.org/10.1353/etc.2015.0003>
- Kleinman, K. E., & Saigh, P. A. (2011). The effects of the good behavior game on the conduct of regular education New York City high school students. *Behavior Modification*, 35(1), 95–105. <https://doi.org/10.1177/0145445510392213>
- Kuhl, S., Rudrud, E. H., Witts, B. N., & Schulze, K. A. (2015). Classroom-based interdependent group contingencies increase children's physical activity. *Journal of Applied Behavior Analysis*, 48(3), 602–612.
- Lambert, A. M., Tingstrom, D. H., Sterling, H. E., Dufrene, B. A., & Lynne, S. (2015). Effects of tootling on class-wide disruptive and appropriate behavior of upper-elementary students. *Behavior Modification*, 39(3), 413–430. <https://doi.org/10.1177/0145445514566506>
- Lastrapes, R. E., Fritz, J. N., & Casper-Teague, L. (2018). Effects of the teacher versus students game on teacher praise and student behavior. *Journal of Behavioral Education*, 27(4), 419–434. <https://doi.org/10.1007/s10864-018-9306-y>
- Lee, K., Penrod, B., & Price, J. N. (2017). A comparison of cost and reward procedures with interdependent group contingencies. *Behavior Modification*, 41(1), 21–44.
- Ling, S., Hawkins, R. O., & Weber, D. (2011). Effects of a class-wide interdependent group contingency designed to improve the behavior of an at-risk student. *Journal of Behavioral Education*, 20(2), 103–116. <https://doi.org/10.1007/s10864-011-9125-x>
- Litow, L., & Pumroy, D. K. (1975). A brief review of classroom group-oriented contingencies. *Journal of Applied Behavior Analysis*, 8(3), 341–347. <https://doi.org/10.1901/jaba.1975.8341>
- Little, S. G., Akin-Little, A., & O'Neill, K. (2015). Group contingency interventions with children—1980-2010: A meta-analysis. *Behavior Modification*, 39(2), 322–341. <https://doi.org/10.1177/0145445514554393>
- Lo, Y., & Cartledge, G. (2004). Total class peer tutoring and interdependent group oriented contingency: Improving academic and task related behaviors of fourth-grade urban students. *Education and Treatment of Children*, 27(3), 235–262.
- Lum, J. D. K., Tingstrom, D. H., Dufrene, B. A., Radley, K. C., & Lynne, S. (2017). Effects of tootling on classwide disruptive and academically engaged behavior of general-education high school students. *Psychology in the Schools*, 54(4), 370–384. <https://doi.org/10.1002/pits.22002>
- Lum, J. D. K., Radley, K. C., Tingstrom, D. H., Dufrene, B. A., Olmi, D. J., & Wright, S. J. (2019). Tootling with a randomized independent group contingency to improve high school class-wide

- behavior. *Journal of Positive Behavior Interventions*, 21(2), 93–105. <https://doi.org/10.1177/1098300718792663>
- Lynne, S., Radley, K. C., Dart, E. H., Tingstrom, D. H., Barry, C. T., & Lum, J. D. (2017). Use of technology-enhanced version of the good behavior game in an elementary school setting. *Psychology in the Schools*, 54(9), 1049–1063. <https://doi.org/10.1002/pits.22043>
- Maggin, D. M., Pustejovsky, J. E., & Johnson, A. H. (2017). A meta-analysis of school-based group contingency interventions for students with challenging behavior: An update. *Remedial and Special Education*, 38(6), 353–370. <https://doi.org/10.1177/0741932517716900>
- McKissick, C., Hawkins, R. O., Lentz, F. E., Hailey, J., & McGuire, S. (2010). Randomizing multiple contingency components to decrease disruptive behaviors and increase student engagement in an urban second-grade classroom. *Psychology in the Schools*, 47(9), 944–959. <https://doi.org/10.1002/pits.20516>
- Moeyaert, M., Maggin, D., & Verkuilen, J. (2016). Reliability, validity, and usability of data extraction programs for single-case research designs. *Behavior Modification*, 40(6), 874–900. <https://doi.org/10.1177/0145445516645763>
- Monson, K. D., Caldarella, P., Anderson, D. H., & Wills, H. P. (2020). Improving student behavior in middle school art classrooms: Initial investigation of CW-FIT tier 1. *Journal of Positive Behavior Interventions*, 22(1), 38–50. <https://doi.org/10.1177/1098300719864704>
- Naylor, A. S., Kamps, D., & Wills, H. (2018). The effects of the CW-FIT group contingency on class-wide and individual behavior in an urban first grade classroom. *Education & Treatment of Children*, 41(1), 1–30. <https://doi.org/10.1353/etc.2018.0000>
- Nelson, M. A., Caldarella, P., Hansen, B. D., Graham, M. A., Williams, L., & Wills, H. P. (2018). Improving student behavior in art classrooms: An exploratory study of CW-FIT tier 1. *Journal of Positive Behavior Interventions*, 20(4), 227–238. <https://doi.org/10.1177/1098300718762744>
- Nieto, P., & Wiskow, K. M. (2020). Evaluating adult interaction during the Step It UP! game to increase physical activity in children. *Journal of Applied Behavior Analysis*, 53(3), 1354–1366. <https://doi.org/10.1002/jaba.699>
- Normand, M. P., & Burji, C. (2020). Using the Step it UP! game to increase physical activity during physical-education classes. *Journal of Applied Behavior Analysis*, 53(2), 1071–1079. <https://doi.org/10.1002/jaba.624>
- Parker, R. I., & Vannest, K. (2009). An improved effect size for single-case research: Nonoverlap of all pairs. *Behavior Therapy*, 40(4), 357–367. <https://doi.org/10.1016/j.beth.2008.10.006>
- Pennington, B., & McComas, J. J. (2017). Effects of the good behavior game across classroom contexts. *Journal of Applied Behavior Analysis*, 50(1), 176–180. <https://doi.org/10.1002/jaba.357>
- Pokorski, E. A., Barton, E. E., & Ledford, J. R. (2017). A review of the use of group contingencies in preschool settings. *Topics in Early Childhood Special Education*, 36(4), 230–241. <https://doi.org/10.1177/0271121416649935>
- Radley, K. C., Dart, E. H., & O’Handley, R. D. (2016). The quiet classroom game: A class-wide intervention to increase academic engagement and reduce disruptive behavior. *School Psychology Review*, 45(1), 93–108. <https://doi.org/10.17105/SPR45-1.93-108>
- Scott, K. C., Skinner, C. H., Moore, T. C., McCurdy, M., Ciancio, D., & Cihak, D. F. (2017). Evaluating and comparing the effects of group contingencies on mathematics accuracy in a first-grade classroom: Class average criteria versus unknown small-group average criteria. *School Psychology Review*, 46(3), 262–271. <https://doi.org/10.17105/SPR-2017-0037.V46-3>
- Sewell, A. (2020). An adaption of the good behavior game to promote social skill development at the whole-class level. *Educational Psychology in Practice*, 36(1), 93–109. <https://doi.org/10.1080/02667363.2019.1695583>
- Silva, E., & Wiskow, K. M. (2020). Stimulus presentation versus stimulus removal in the good behavior game. *Journal of Applied Behavior Analysis*, 53(4), 2186–2198. <https://doi.org/10.1002/jaba.709>
- Vidoni, C., Azevedo, L., & Eberline, A. (2012). Effects of a group contingency strategy on middle school physical education students’ heart rates. *European Physical Education Review*, 18(1), 78–96. <https://doi.org/10.1177/1356336X11430652>
- Wahl, E., Hawkins, R. O., Hadyon, T., Marsicano, R., & Morrisin, J. Q. (2016). Comparing versions of the good behavior game: Can a positive spin enhance effectiveness. *Behavior Modification*, 40(4), 493–517. <https://doi.org/10.1177/0145445516644220>
- Wahl-Alexander, Z., Malecki, A., & Smart, S. (2020). The effect of prompting and group contingency on middle school students’ physical activity during a badminton sport education season. *Physical Educator*, 77(2), 208–229. <https://doi.org/10.18666/TPE-2020-V77-I2-9570>
- Weis, R., Osborne, K. J., & Dean, E. L. (2015). Effectiveness of a universal, interdependent group contingency program on children’s academic achievement: A countywide evaluation. *Journal of Applied School Psychology*, 31(3), 199–218. <https://doi.org/10.1080/15377903.2015.1025322>
- Wills, H. P., Iwaszuk, W. M., Kamps, D., & Shumate, E. (2014). CW-FIT: Group contingency effects across the day. *Education & Treatment of Children*, 37(2), 191–210.
- Wills, H. P., Caldarella, P., Mason, B. A., Lappin, A., & Anderson, D. H. (2019). Improving student behavior in middle schools: Results of a classroom management intervention. *Journal of Positive Behavior Interventions*, 21(4), 213–227. <https://doi.org/10.1177/1098300719857185>
- Wright, R. A., & McCurdy, B. L. (2012). Class-wide positive behavior support and group contingencies: Examining a positive variation of the good behavior game. *Journal of Positive Behavior Interventions*, 14(3), 173–180. <https://doi.org/10.1177/1098300711421008>

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