Call Me, Maybe: Examining the Compliance Rates and Cost-effectiveness of a Participant-initiated Automated Telephone System with Children

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Abstract: Telephone-delivered physical activity interventions have proven to be effective with adults, yet there is no research using this strategy with children. The purpose of the current study was to examine the feasibility of implementing a participant-initiated automated telephone imagery intervention with children. The outcomes of interest were compliance rates to and cost-effectiveness of the telephone system. Fifty-nine Grade 5 and 6 students (M̅ age = 10.24, SD = 0.80; 36 females) from two schools were randomized into either an imagery group or a short story group, and some individuals in both of these groups received an individual incentive and some received a class incentive. All participants were asked to call the automated system from home 3x/week for the duration of the study. The high compliance rate, the minimal cost of implementing such a system, and the ability to reach more children than a face-to-face intervention makes the telephone an attractive modality for behavior change researchers.

Key words: Telephone-based intervention system, incentive, imagery script, children, active play, physical activity.

1. Introduction

Although telephone interventions have been effective in creating behaviour change in adults, and specific to the present study increasing their levels of physical activity [1, 2], there has been no research using this strategy with children. This is surprising given children’s cell phone ownership has increased 68% in the past five years [3]. Delivering an intervention by telephone is cost effective and has potential for wide population reach [2], which may enhance the generalizability. Therefore, the purpose of our study was to examine the feasibility of conducting a participant-initiated automated telephone imagery intervention with children. The outcome variables of interest were compliance rates to and cost-effectiveness of the telephone system.

1.1 The Telephone as a Delivery Modality for Behavior Change

There exists a variety of wide reaching delivery modalities aimed at increasing the physical activity levels of adults including mailed print material, computer tailored interventions, and internet-delivered interventions [2]. Given the telephone continues to be one of the most widely available communication tools, physical activity interventions can greatly benefit from this modality. Despite the strong evidence to support the delivery of telephone interventions on adults’ physical activity, pure telephone-delivered interventions are rare [1]. More surprising however, is the fact that no telephone intervention studies have aimed to increase physical activity in children, to the researchers’ knowledge. Given the steady increase in children owning phones [3], it seems that this modality of delivery may be an important avenue of research.

Studies have used automated telephone
interventions with adults or via the adult to enact health behavior change in the child (e.g., diabetes [4]), with some success. Other telephone interventions have targeted youth with respect to smoking cessation [5] and abstinence from alcohol [6], again with some success. Research has capitalized on the smart phone industry and delivered a multimedia phone-based youth smoking cessation program, including video and text messaging, with initial success [7].

Research has indicated a difference between telephone interventions in which calls are made to the participants versus those that require participants to be proactive and call the system (i.e., participant-initiated [1]). Indeed, in those studies where participants were required to call in, implementation was quite low [8]. In fact, in a meta-analytic study assessing telephone interventions as a modality for physical activity and dietary behavior change [1], the authors reported that telephone protocols appear to be implemented with a high degree of success, save those participant-initiated calls to automated systems. Thus, an issue related to participant-initiated interventions is compliance. Some authors have suggested that incentives and external rewards can help enhance compliance rates to intervention protocols [9]. With adults, monetary incentives have shown promise in changing health related behaviors including physical activity and smoking cessation [10].

1.2 Incentive

An incentive is defined as “that which influences or encourages to action; motivate; spur; stimulus” [11]. The use of incentives has become an increasingly popular strategy for promoting healthy behaviours such as smoking cessation and increased physical activity [12, 13]. The purpose of offering an incentive to research participants is to maximize participant recruitment, compliance, and retention [14].

There are few guidelines for offering incentives to children, save that they should not be coercive, they should be age appropriate, and should increase in value as the burden placed on the child increases [15]. Research has shown that monetary incentives are effective in both recruiting and retaining children in studies [16].

With children, researchers have suggested linking the incentive to the research task [15]. This approach is referred to as the wage-payment model [17]. According to this model, the amount of the inducement is calculated using an hourly wage and an approximated time for completing the research task, and as such the child would be paid for their time, effort and burden. As the burden increases (e.g., longitudinal data collection), however, the monetary value should increase [15]. The wage-payment model has been found to be appropriate with children older than 9 years of age because of their ability to comprehend the meaning and value of money [17]. A wage-payment model may help to ensure the participants complete the research task (i.e., call into the telephone system) and therefore receive the required intervention dose. Accordingly, a wage-payment model was incorporated in the present study.

1.3 Imagery Scripts as an Intervention Tool

Mental imagery is described as creating and recreating experiences in one’s mind [18] and is an effective intervention tool used in a variety of contexts. Previous researchers have suggested that if an individual imagines a desired future behaviour or a hypothetical event taking place, this can increase the likelihood of that behaviour or event occurring in reality [19]. Within the sport context, imagery has been shown to improve sport performance, sport strategies, and collective efficacy of young athletes [20]. Within the physical activity context, imagery has been shown to enhance motivation, exercise self-efficacy, and integrated regulation for exercise [21].

Most interventions have used scripts to ensure the correct use of imagery [22]. Written scripts read aloud to participants or read by the participants themselves
is the most common method of script delivery in both child [23] and adult samples [24]. Several studies have used an audio-recorded script wherein the participant listened to the audio script either individually (e.g., at home, before practice) or in the laboratory in the presence of the researcher [25]. With other health behaviors, imagery audio scripts have been used to curb tobacco craving [26] and abdominal pain [27] in children and youth.

Accordingly, we [28] examined the effects of an automated telephone imagery intervention on children’s physical activity. We found the intervention positively influenced levels of physical activity, as measured by pedometer step count. To our knowledge, this was the first study to deliver an imagery intervention via the telephone with either adult or child samples in any research domain and thus presents a novel approach in changing people’s behaviour. Given the uniqueness of using the telephone as a means to deliver the imagery scripts, this study reports on a major component of our intervention research, namely the feasibility of employing a participant-initiated automated telephone system with children.

2. Method

2.1 Participants

The current study recruited 83 male (n = 37) and female (n = 46) students between the ages of 9 and 11 (M = 10.23 years, SD = 0.85). These participants were recruited from two elementary schools in Southwestern Ontario. Both schools were situated in predominantly middle class areas. The type of incentive offered varied between the two schools. Forty-five students comprised the individual incentive school and 38 students comprised the class incentive school. Children from each school were randomized to either the imagery group (individual incentive school, n = 27; class incentive school, n = 20) or the short story (control) group (individual incentive school, n = 18; class incentive school, n = 18).

2.2 Measure

The primary outcome of interest was the weekly and overall compliance rates to the telephone guideline (i.e., call system 3 times per week for 4 consecutive weeks for a total of 12 phone calls). Weekly compliance rates for the groups (imagery and short story), schools (individual incentive and class incentive), and groups within schools (imagery-individual incentive, imagery-class incentive, short story-individual incentive, and short story-class incentive) were calculated by dividing the mean number of completed phone calls by the number of possible weekly calls (i.e., 3). Similarly, overall compliance rates for the groups, schools, and groups within schools were calculated by dividing the mean number of completed phone calls by the total number of possible calls (i.e., 12). A secondary outcome of interest was the cost-effectiveness of the automated telephone system, which was assessed by calculating the total cost of the system (e.g., development, maintenance, cost per minute).

2.3 Procedures

Ethical approval was obtained from the universities’ research ethics boards. The schools’ principals were contacted and written consent to collect research data in their schools was sought. Following this, arrangements were made for the first and second authors, along with their corresponding graduate student, to meet with the teachers to discuss the purpose and details of the study. All five teachers volunteered to participate in the study. Children of these classes received an information package including a written description of the study and consent/assent forms. Parents and children interested in participating in the study returned the signed forms (consent and assent) to the students’ homeroom teacher. In cases where parents did not want their child to participate in the study, opportunity to decline participation was provided on the consent form. The decision not to partake in the study was the only
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exclusion criteria.

The 6-week study comprised weekly meetings wherein the research assistants met with the students during their lunch recess. At the initial meeting (Week 1) participants received an ID (identification) number and a pedometer (objective measure of children’s levels of active play). The research assistants showed the children how to use both the pedometer and telephone system. Additionally, at each weekly meeting children completed questionnaires that assessed outcome variables such as motivation, active play imagery, satisfaction of the basic psychological needs, and level of physical activity. However, given the focus of the current paper is on the methodology, no data related to the psychological or physical activity variables are presented. The weekly meetings also served as an opportunity for the researchers to remind the children to call the system.

2.4 Telephone Recordings

The content of the telephone recordings differed between the imagery group and short story group. Children in the imagery group listened to scripts requiring them to imagine themselves being active during their free time. Four scripts were developed and followed similar procedures employed in previous research [29]. Script development was guided by the tenets of SDT (Self-Determination Theory) [30]. A new imagery script was delivered each week. Children in the short story group listened to two age appropriate short stories: The Case of the Daily Telegraph and The Case of the Broken Lock (included in the book “The Adventures of Jack Lime” by James Leck). Each short story was divided into six chapters. The first short story was delivered during the first two weeks of the intervention while the second short story was delivered during the remaining two weeks. All recordings (i.e., scripts and short stories) were approximately five minutes in length and were voice recorded by the same individual (member of research team). Children were asked to call the telephone system three times per week for four consecutive weeks and were encouraged to choose when and on what days to call the system. Children were also asked to make no more than one call per day.

2.5 Automated Telephone System

The automated telephone system was specifically designed for the current study. The purpose of the telephone system was to deliver the pre-recorded scripts and short stories to the participants. The technology consisted of a telephone network system and an advanced telecommunications system (i.e., CallPilot), which answered incoming calls, provided voice prompts, and utilized advanced voicemail capabilities. The voice prompts were designed to route the participants to the appropriate recording. Participants responded to the voice prompts by pressing designated numbers on their touch-tone telephone keypad. Participants initiated all phone calls.

The design of the telephone system is illustrated in Fig. 1. When participants called the system, they were prompted with a welcome menu. Those in imagery group were instructed to press 1 on their telephone keypad, and those in the short story group were instructed to press 2. Participants in the imagery group were immediately directed to the designated script. Participants in the short story group, however, were prompted with a second menu. At this time, participants were instructed to select one of three chapters from the short story by pressing 1 for chapter 1, 2 for chapter 2, and so on. At the completion of all telephone recordings, participants were asked to leave a voicemail consisting of their ID number. The voicemail component of the telephone system allowed the research team to monitor the number of times each participant called into the system.

2.6 Type of Incentive

Children in the present study were offered inducements (monetary gift cards to a sporting goods
store) as an encouragement to call the telephone system. Children received an incentive for each phone call made. This approach of linking the incentive to the research task is consistent with the wage-payment model [17]. If children completed all 12 phone calls (5 minutes per call), their total time involvement was 60 minutes. Each phone call was valued at $2.50. Therefore, by the end of the intervention children who completed three phone calls each week for four weeks received a total of $30 in gift cards.

Initially, we had intended that all participants would receive the same type of incentive. However, not all teachers were agreeable to this model. As such, the type of incentive differed between the two schools. More specifically, children from one school received an individual incentive based on the number of times they called the system. That is, children had the opportunity to spend the gift card on items of their choice (e.g., running shoes, bike helmet). Further, children received their incentive each week following confirmation of completed calls. For example, a child who called the system three times during Week 2 received a $7.50 gift card at the beginning of Week 3. Alternatively, children from the other school were rewarded as a class and the class received one gift card at the end of the intervention. The class incentive allowed the purchasing of sporting goods (e.g., basketballs, hula-hoops) for all students (both participants and non-participants of the study) to use during their free time. The teachers and research team agreed upon both approaches of incentive delivery prior to data collection.

2.7 Data Analysis

Fifty-nine of the 83 participants successfully completed the intervention and therefore were retained
in the analysis. The 24 participants that were excluded from the analysis either dropped out of the intervention prior to the completion of the study or had incomplete data. Thus, the final sample consisted of 59 male (n = 23) and female (n = 36) students (M_{age} = 10.24, SD = 0.80). Of the 33 children in the imagery group, 21 comprised the individual incentive school and 12 comprised the class incentive school. Likewise, of the 26 participants in the short story group, 12 comprised the individual incentive school and 14 comprised the class incentive school.

Preliminary analyses included independent samples t-tests to determine if any differences existed between groups and schools for age and gender. The main analysis consisted of an ANOVA with the between-subject independent variables including group (2 levels), and school (2 levels), and the within-subject independent variable including time (4 levels). The number of completed phone calls was the dependent variable. Thus, a 2 (group; imagery, short story) × 2 (school; individual incentive, class incentive) × 4 (time; Weeks 1-4) analysis of variance (ANOVA) with repeated measures on time was conducted. An analysis of the cost to develop and deliver the telephone system used in the current study was also calculated.

3. Results

3.1 Preliminary Analyses

Participant descriptives by group and school are presented in Table 1. Results from the t-test revealed a significant difference between groups on age, t(57) = 4.92, P = 0.00. No difference between groups was found for gender, t(57) = 2.69, P = 0.03 and no differences between schools were found for age, t(57) = 1.02, P = 0.55, or gender, t(57) = 4.56, P = 0.26.

Weekly and overall compliance rates for the groups (imagery and short story), schools (individual incentive and class incentive), and groups within schools (imagery-individual incentive, imagery-class incentive, short story-individual incentive, and short story-class incentive) are presented in Table 2. Children in the imagery group had higher weekly (84%-91%) and overall (87.08%) compliance rates to the telephone system than children in the short story group (68%-88.33%, 80.75%, respectively). Further, children who received the individual incentive had higher weekly (89%-93%) and overall (90.12%) compliance rates compared to those who received a class incentive (69.33%-86%, 77.25%, respectively).

3.2 Main Analysis

Results revealed a main effect for time, Wilk’s Λ = 0.813, F(3, 53) = 0.01, P = 0.01, η² = 0.19, and a time X group interaction, Wilk’s Λ = 0.86, F(3, 53) = 2.87, P = 0.05, η² = 0.14. Pairwise comparisons for the main effect for time indicated compliance rates were significantly different between Week 1 (80.33%) and Week 4 (89.67%). Further analysis of the interaction revealed compliance rates significantly differed between the imagery group (90%) and short story group (68%) at Week 1. No significant multivariate effects were found for the time X school interaction, Wilk’s Λ = 0.97, F(3, 53) = 0.63, P = 0.60, η² = 0.04, or the time X school X group interaction, Wilk’s Λ = 0.87, F(3, 53) = 2.61, P = 0.06. While there was no between-subjects main effect for group, F(1, 55) = 1.42, P = 0.248, η² = 0.03, a between-subjects main effect for school was found, F(1, 55) = 11.61, P = 0.00, η² = 0.17. The main effect for school demonstrated that the children from the individual incentive school had a higher overall compliance rate to the telephone system (90.12%) compared to children from the class incentive school (77.25%).

A total of 594 phone calls were made over the course of four weeks. Each phone call was approximately five minutes in duration and thus cost approximately 0.10 cents per call (0.02 cents per minute). No charges were applied for the development and maintenance of the telephone system. Therefore, the total cost of the telephone system was $59.40 (CAD).
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Table 1  Participant Descriptives by Group and School.

<table>
<thead>
<tr>
<th></th>
<th>Individual Incentive School</th>
<th>Class Incentive School</th>
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<tbody>
<tr>
<td>Experimental groups</td>
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<tr>
<td>Imagery</td>
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<td>12</td>
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<tr>
<td>Short story</td>
<td>12</td>
<td>14</td>
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<tr>
<td>Gender</td>
<td></td>
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<tr>
<td>Male</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>Female</td>
<td>22</td>
<td>14</td>
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<tr>
<td>Years of age</td>
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<tr>
<td>9</td>
<td>1</td>
<td>12</td>
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<tr>
<td>10</td>
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<td>10</td>
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<td>11</td>
<td>23</td>
<td>4</td>
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<tr>
<td>Imagery Group</td>
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<td>Short Story Group</td>
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<tr>
<td>Schools</td>
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<tr>
<td>Individual incentive</td>
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<tr>
<td>Class incentive</td>
<td>12</td>
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<tr>
<td>Gender</td>
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<tr>
<td>Male</td>
<td>15</td>
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<tr>
<td>Female</td>
<td>18</td>
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<tr>
<td>Years of age</td>
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<td>9</td>
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<td>11</td>
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</tr>
</tbody>
</table>

Table 2  Weekly and Overall Means and Compliance Rates (%) for Entire Sample, Group, School, and Groups within Schools.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Week 1</th>
<th>Week 2</th>
<th>Week 3</th>
<th>Week 4</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>2.41 (80.33)</td>
<td>2.53 (84.33)</td>
<td>2.51 (83.67)</td>
<td>2.69 (89.67)</td>
<td>10.14 (84.50)</td>
</tr>
<tr>
<td>Group</td>
<td></td>
<td></td>
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<tr>
<td>Imagery</td>
<td>2.70 (90)</td>
<td>2.55 (85)</td>
<td>2.52 (84)</td>
<td>2.73 (91)</td>
<td>10.45 (87.08)</td>
</tr>
<tr>
<td>Short story</td>
<td>2.04 (68)</td>
<td>2.50 (83.33)</td>
<td>2.50 (83.33)</td>
<td>2.65 (88.33)</td>
<td>9.69 (80.75)</td>
</tr>
<tr>
<td>School</td>
<td></td>
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<tr>
<td>Individual incentive</td>
<td>2.67 (89)</td>
<td>2.70 (90)</td>
<td>2.67 (89)</td>
<td>2.79 (93)</td>
<td>10.82 (90.12)</td>
</tr>
<tr>
<td>Class incentive</td>
<td>2.08 (69.33)</td>
<td>2.31 (77)</td>
<td>2.31 (77)</td>
<td>2.58 (86)</td>
<td>9.27 (77.25)</td>
</tr>
<tr>
<td>Groups within schools</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Imagery-individual incentive</td>
<td>2.86 (95.33)</td>
<td>2.86 (95.33)</td>
<td>2.76 (92)</td>
<td>2.76 (92)</td>
<td>11.19 (93.25)</td>
</tr>
<tr>
<td>Imagery-class incentive</td>
<td>2.42 (80.67)</td>
<td>2.08 (69.33)</td>
<td>2.08 (69.33)</td>
<td>2.67 (89)</td>
<td>9.25 (77.08)</td>
</tr>
<tr>
<td>Short story-individual incentive</td>
<td>2.33 (77.67)</td>
<td>2.50 (83.33)</td>
<td>2.50 (83.33)</td>
<td>2.83 (94.33)</td>
<td>10.17 (84.75)</td>
</tr>
<tr>
<td>Short story-class incentive</td>
<td>1.79 (59.67)</td>
<td>2.50 (83.33)</td>
<td>2.50 (83.33)</td>
<td>2.59 (86.33)</td>
<td>9.29 (77.42)</td>
</tr>
</tbody>
</table>

4. Discussion

The overall aim of this study was to examine the feasibility of a participant-initiated telephone intervention system with children. For the purpose of the current study, the outcomes of interest were compliance rates to and cost-effectiveness of the telephone system. Given the high compliance call-in rates and the minimal cost, we conclude this type of intervention modality to be: (1) feasible with children and (2) a practical approach for future researchers to consider.
Our results differ considerably from two previous studies with adults using an automated telephone system, which required the participants to call the system, wherein the implementation was quite low (31% [8]; 24% [31]). There are several possible reasons as to the success of our current intervention modality. The call-in system was novel and easy for the participants to use. It is possible the incentive (regardless of the school: individual or class) motivated children to follow through with the study’s protocol. Previous research has indicated that children greater than nine years of age understand the concept of money [17] and therefore it can be a strong motivator. Finally, the high compliance rates may be a result of the content offered in both the imagery scripts and the short stories. The reliance on scripts has proven to be an effective method used to deliver guided imagery interventions [32].

4.1 Novel and Easy Telephone System

The participants in the current system found the protocol novel and enjoyable. Informal comments from the participants indicated they thought the call-in system was “cool” and “fun to use”. As such, the task of calling into the system three times per week may not have seemed like a burden on the children. Previous research assessing telephone interventions for physical activity and behavior change [1] found the number of calls varied widely across studies. The current recordings were short (5 minutes in duration), and the children were only required to call in 12 times over the course of four weeks. Thus, our protocol may have contributed to the relative high rate of compliance, regardless of the type of incentive. Additionally, the actual design of the telephone system was simple for the children to use.

Although there is no comparable statistics for Canadian children (< 13 year of age), it is important to note that those ages 13-24 are the largest group of cell phone users in Canada. In a 2009 US study, it was found that 20% of all children aged 6-11 years owned a cell phone, further noting it was the most dramatic increases when compared to 2005 data (11.90% [3]). Of course, even if a child does not own a cell phone, most households in Canada have a telephone (landline or cell). As such, delivering the intervention via the telephone is an easy and far reaching method.

Though the children indicated their enjoyment with the telephone system, also important to the research was the cost-effectiveness of the system. For all 594 completed phone calls, the total cost of the phone system was just under $60.00 CAD. Had the scripts been delivered face-to-face or via an audio recording in a laboratory, the cost would have been much higher in personnel fees and incidentals (e.g., refreshments, parking fees). With the current telephone system, many children were able to be part of the study and receive a high dose of the intervention at a very low cost.

4.2 Incentive

Some children in the current study received individual gift cards to a sporting goods store, while others received a class incentive. Incentives are appealing to children especially those of cash or gift certificates [15]. According to SDT [30], the process of internalization can change from a once extrinsically prompted behaviour to an intrinsically prompted behaviour. Initially, extrinsic rewards were thought to undermine intrinsic motivation [33]; however, later research has demonstrated this belief to be erroneous [34]. It is possible that an extrinsically motivated behaviour, absent of coercion, may be viewed as personally important and self-determined (e.g., integrated regulation). Moreover, feedback from the children in the current study indicated that they enjoyed listening to the recordings—a key affect of intrinsic motivation [30].

In addition, the children were able to choose the day, the time, and the frequency with which they called the system. Those who received an individual gift card were in charge of how much or how little they could
earn (with a maximum amount per week) and were free to purchase any sporting merchandise they liked, thus potentially strengthening the sense of autonomy. Possible support for this explanation is that those receiving the individual incentive called in more often than those receiving the class incentive. More specifically, results from our study indicated that, among the children from the short story group, those who received an individual incentive completed considerably more calls in Week 1 than children who received a class incentive. This finding further highlights the value of using an incentive to encourage participant call-in compliance. Riesch et al. [35] indicate that children might feel less positive about participating in a study if the incentives never reach them (i.e., goes to the school or parents). As such, this may be one reason the weekly and overall compliance rates for those receiving the class incentive were lower than those receiving the individual incentive.

There is little research examining the efficacy of individual vs. group-based incentives. In one of the few studies examining incentive types, Kullgren et al. [36] point to the sum of money used as the incentive, as well as the use of frequent rewards, as important motivators. John et al. [12] extended this latter sentiment showing that rewards that are provided immediately after the behaviour have the greatest incentive value. Rice and Broome [15] also emphasize the importance of distributing the incentive over the course of the study to encourage continued participation of the child. As previously mentioned, the current study employed a wage-payment model, which necessitates reimbursing the child for their time and effort. In essence, children received payment for service. In support of previous research [15], we distributed the monetary incentive on a weekly basis for the individual incentive group, therefore encouraging continued participation for the duration of the study. Comparatively, the class incentive was calculated by the researcher over the course of the study and given to the school only at the completion of the study. The results from the current study seem to indicate stronger compliance to the study protocol with an individual versus a group incentive.

4.3 Content of Audio Recordings

A systematic review of guided imagery interventions indicate scripts remain the most common method of delivery [32]. In addition to the content of the imagery script being appropriate to the situation (i.e., active play), the imagery script also followed key elements from Lang’s bioinformational theory [37] including stimulus propositions (e.g., kicking or throwing a ball or imaging playing with friends), and stimulus response (e.g., feeling the ball hit your foot as you receive a pass or feeling your heart rate increase as you run around the park) in order to generate a vivid and effective image. This is consistent with previous research that has noted the importance of incorporating stimulus proposition and responses into scripts [38]. Perhaps the creation of vivid and effective images in the current study’s scripts positively influenced compliance rate. In general, our results indicated that children from the imagery group had higher compliance rates to the telephone system than children from the short story group, regardless of the type of incentive (individual vs. class). Previous imagery researchers have suggested that individualized and meaningful scripts may result in greater participation in imagery programs [23]. Though the imagery scripts were not necessarily individualized, it is likely that children perceived the scripts as more personal in comparison to children in the short story group.

For those in the short story group, their automated telephone recordings consisted of two age appropriate short stories. “The Adventures of Jack Lime” is a popular series for children (10-14 years), selected by Booklist Magazine as one of the Top Ten Books for Youth and as one of the Top Ten Crime Fiction Books for Youth of 2010. The book consists of three stand-alone short stories in which Jack Lime, a private
investigator, solves crimes for his classmates. In the current study, the children in the short story group listened to one story in Weeks 1–2, and another short story in Weeks 3–4 (1 chapter per phone call, 6 chapters per story). Given the short story group had considerably fewer calls than the imagery group in Week 1, it is possible the story was slow to develop but then ramped up as the plot thickened as Jack tried to uncover who stole his classmates’ hamster, Carver.

For the second short story, it is possible that the children drew on their previous experience and anticipated another slow beginning but realized if they continued to call into the phone system the end results would be a great story. Our findings support this argument. For instance, among the children from the individual incentive school, those who listened to the imagery audio recordings had higher compliance rates in every week than those who listened to the short story audio recordings, except in Week 4. Children from the short story group may have completed more calls in Week 4 because they were eager to discover how the story ends. Contrastingly, perhaps the children in the imagery group, made more calls in the first week because they knew not what to expect (e.g., hearing an imagery script was novel, hearing an audio book was not).

4.4 Conclusion and Future Directions

The larger scale study [28] found that an imagery intervention positively influenced children’s activity levels. At the end of the intervention, children who received the imagery intervention reported higher levels of active play compared to children in the control group. Further, intrinsic motivation was found to mediate the relationship between the imagery intervention and children’s active play, wherein children in the imagery group reported higher levels of intrinsic motivation than children in the control group. Given the promising findings of the larger scale study [28], the results of the current feasibility study are especially important. Our findings suggest that compliance rates to a participant-initiated telephone system can be improved with the use of incentives. They also suggest that the nature of the incentive (i.e., individual vs. group) and content of the audio recordings may influence call-in compliance. Collectively, the high compliance rate, the minimal cost of implementing a telephone intervention, and ability to reach more children than a face-to-face intervention makes the telephone an attractive modality for future researchers.

Recommendations for future studies may include text messaging as a supplement to the telephone system, audio scripts as boosters after the formal completion of the study, and implementation of the telephone system with other areas of behavior change. Eakin et al. [1] found that multiple intervention approaches are better than individual intervention approaches for physical activity and dietary behavior change. As such, receiving texts on one’s phone as a reminder to call the automated system may improve compliance rates to the study’s protocol. In order to maintain behavior change, future researchers may want to include audio scripts that could be used as boosters when the intervention is complete. Telephone interventions are ideal in this regard as participants can call in for “booster” calls and are therefore more cost effective than face-to-face meetings. Finally, given the effectiveness of the automated telephone system for the current study, future researchers may implement this method for other healthy behavior change with children such as smoking cessation, self-regulation, stress management, and abstinence from alcohol.

References


Call me, maybe: Examining the Compliance Rates and Cost-effectiveness of a Participant-Initiated Automated Telephone System with Children


[27] van Tilburg, M., Chitkara, D. K., Palsson, O. S., Turner,
Call me, maybe: Examining the Compliance Rates and Cost-effectiveness of a Participant-Initiated Automated Telephone System with Children


