

Using Functional Behavioral Assessment Data to Infer Learning Histories and Guide Interventions: A Consultation Case Study

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Abstract

A teacher requested behavioral consultation services to address a first-grade student's disruptive behavior. Functional behavior assessment (FBA) suggested the behavior was being reinforced by "negative" teacher attention (e.g., reprimands, redirections, response cost). Based on this analysis, the teacher and consultant posited that this student had a learning history such that presentation of rules or directions served as discriminate stimuli for rule breaking behavior or not following directions (e.g., oppositional-defiant behaviors). Thus, they developed, implemented, and evaluated an intervention designed to increase teachers attention applied when the student was engaged in desired behaviors, *without* drawing attention to the contingency. Analysis of A-B-A-B phase data suggests that the intervention caused a decrease in the disruptive behaviors. Discussion focuses on limitations, future research, and how FBA data provides evidence of learning histories that can be used to guide intervention selection and development.

Keywords: functional behavioral assessment, attention, decreasing the salience of the contingency, behavioral consultation, oppositional-defiant behavior.

Even experienced teachers often have difficulty managing inappropriate behaviors (Fudge, Reece, Skinner, & Cowden, 2007; Kauffman, Wong, Lloyd, Hung, & Pullen, 1991). Bergan (1977) developed a four stage behavioral consultation model suited for addressing these behavior problems. Since Bergan first developed this model, researchers have advanced our understanding of functional behavioral assessment (FBA) procedures designed to link assessment to interventions (Skinner, Freeland, & Shapiro, 2003). FBA data can provide practitioners with information that may allow them to identify what is reinforcing inappropriate behaviors in classroom environments. Once these variables are identified, educators can engage in consultation and develop interventions based on their FBA data (Watson & Steege, 2003).

Some inappropriate behaviors are more disruptive than others. Consider a student who is cheating on an exam (i.e., looking at his notes) and a student who is talking loudly and using inappropriate language during teacher-led group instruction. The cheating behavior is typically conducted in a manner that does not attract attention and, therefore, does not disrupt classmates or teachers. However, the loud and inappropriate language during teacher-led group instruction is likely to disrupt educators' efforts to teach and classmates' efforts to learn. In an attempt to cease the presenting disruption, teachers often attend (e.g., reprimand, re-direct) to students engaged in such behaviors. Although this teacher attention that follows disruptive behaviors may be intended to punish those behaviors, in some instances they actually serve as an immediate reinforcement for those behaviors (Gresham, Watson, & Skinner, 2001; Skinner, Neddenriep, Robinson, Ervin, & Jones, 2002).

Knowing that a student's disruptive behaviors are being reinforced with teacher attention suggests several interventions. For example, teachers could apply extinction where they attempt to manage their own behaviors by not attending to the student's disruptive behavior. While such procedures can be effective, extinction may also occasion an initial increase in disruptive behavior rates (extinction burst), enhance the intensity levels of disruptive behaviors, and/or occasion extinction induced creativity which causes these students to alter the form (topography) of their behavior to one that is potentially more disruptive. Each of these changes in behavior may at least temporarily enhance, as opposed to reduce, the

degree of disruption caused by the behavior (Gresham et al., 2001; Lieving, Hagopian, Long, & O'Connor, 2004).

Another alternative is to apply differential reinforcement for a) lower rates of disruptive behaviors, b) incompatible behaviors, and/or c) other behaviors. Thus, if a student is being reinforced with attention for inappropriate behaviors, differential reinforcement could involve reducing attention contingent upon undesired behaviors and increasing attention contingent upon desired behaviors. Researchers suggest using procedures such as labeled praise (e.g., “Ben, I really like the way you are working quietly, good job”) in order to make the contingent relationship more salient, especially with young students (Bernhardt & Forehand, 1975; Bernhardt, Fredericks, & Forbach, 1978; Gillat & Sulzer-Azaroff, 1994; Herschell, Greco, & Filcheck, 2002; Kazdin, 1994; Madsen, Becker, & Thomas, 1968; Thomas, Becker, & Armstrong, 1968).

A second concern with applying differential reinforcement in the form of labeled praise is related to students' idiosyncratic learning histories. FBA can provide an indication of both reinforcers that are currently maintaining undesired behaviors and a student's learning history (Gresham, Watson, & Skinner, 2001). When FBA suggests that reprimands, re-directions, and other attempts to punish undesired behaviors are actually reinforcing these behaviors, these data also suggest that the student has an atypical learning history. Specifically, these data suggest that previously, when presented with rules and/or given directions (stimuli), the student has been reinforced for violating rules and failing to follow directions (e.g., oppositional and/or defiant behaviors). Although this learning history analysis suggests that differential reinforcement for desired behaviors may be effective, (Madsen et al., 1968; Thomas et al., 1968; Zaghawan, Ostrosky, & Al-Khateeb, 2007) it does not support the use of procedures that increase the salience of the stimuli or contingencies such as labeled praise, teaching and posting rules and consequences, and contingency contracts (Aguilar & Navarro, 2008; De Martini-Scully, Bray, & Kehle, 2000; Fudge, et al., 2007; Gillat & Sulzer-Azaroff, 1994; Herschell et al., 2002; Homme, Csanyi, Gonzales, & Rechs, 1970). Rather, this atypical learning history suggests that directions, rules, or contingencies are discriminative stimuli that occasion undesired behaviors. Therefore, increasing the salience of these stimuli (e.g., make the contingent relationship between reinforcement and desired behaviors more salient) may increase the probability of inappropriate behaviors. Alternatively, applying differential reinforcement in a manner that *decreases* the salience of the contingent relationship of attention and desired behaviors may be less likely to occasion oppositional-defiant behaviors.

The current paper describes a behavioral consultation case where a teacher and consultant, a school psychology graduate student, applied behavioral consultation procedures and collected FBA data to develop and evaluate an intervention designed to reduce disruptive behaviors in a 1st-grade student. Of particular interest is the description of the process that led to the development and application of an atypical intervention, which focused on enhancing attention provided by the teacher when the student was engaged in appropriate behaviors (i.e., differential reinforcement of other behaviors), *without* using procedures such as labeled praise that may enhance the salience of the contingent relationship between attention and desired behaviors. As the student's behavior returned to baseline levels during the maintenance phase, the intervention was re-applied, thereby yielding A-B-A-B phases (a withdraw design) that enhanced our ability to evaluate intervention effects (Kazdin, 2004).

Method

Participants and Settings

Participants were a Caucasian, female 35-year-old general-education teacher with 14 years experience, one of her male first-grade students (a Caucasian 6 year-old we will refer to as Ben), and 2 school psychology graduate students. This study was initiated by the teacher who requested consultation services to address Ben's high rates of disruptive behaviors. Ben had not been diagnosed with any emotional, behavioral, or learning disorders.

All procedures were applied at a rural school serving grades Pre-Kindergarten through eight in the Southeast. Approximately, 95% of the students qualified for free or reduced-cost meals. The classroom contained approximately 20 student desks for 19 students (all Caucasian, 7 girls, 12 boys, no students had been retained or identified as having a disability) with chairs that were grouped in sections of 4 desks by having 2 desks face 2 other desks. There was a large table with 5 chairs for small group instruction and a carpeted area with a rocking chair for reading. There were 3 desks with computers, and the teacher's desk was in one corner.

Typical Classroom Activities

The students did not switch classes or teachers except for special classes such as music, art, and physical education. Students ate breakfast and lunch in the school's cafeteria and went outside for recess when weather permitted. During the morning hours, the teacher focused on mathematics, spelling, vocabulary, language arts, and reading skills. Electives and recess were typically scheduled later in the day.

Problem Identification and Functional Assessment

After receiving the referral, the consultant completed a Problem Identification Interview with the teacher in order to specify the problem and develop objectives and measurement procedures (see Kratochwill & Bergan, 1990) with the teacher. During this interview the teacher indicated that Ben engaged in a plethora of disruptive behaviors and frequently did not comply with teacher directions.

When asked to describe consequences for Ben's inappropriate behavior the teacher describe an independent, group-oriented, response-cost system. An apple with each student's name was placed on one wall of the classroom. Inside each apple were three colored worms. Following inappropriate behaviors, (e.g., shouting inside, using inappropriate language, not working on class work, being out of seat, calling a peer a bad name, or not following teacher instructions) the teacher would ask the student to remove one of her/his worms. At the end of each day, the teacher recorded the number of worms left in each student's apple. Consequence for losing worms included losing classroom privileges, such as computer time or recess. Additionally, if all three worms were removed in one day, a note would be sent home to the parents describing their child's inappropriate behaviors. No reward was given to students who did not lose any worms each day. All three worms were returned at the beginning of each day.

The teacher indicated that she did not always remove worms on the first instance of misbehavior or failure to follow her direction. Sometimes, she warned or re-directed students. Although the teacher reported that Ben frequently failed to follow directions, he typically did remove his worms when directed to do so.

During the interview, the teacher and consultant decided that they would target a cluster of Ben's inappropriate behaviors (e.g., shouting, leaving his seat and/or talking to peers without permission, failure to follow directions) and use the data currently being collected (i.e., worms lost) to measure these behaviors. At the end of this meeting the consultant asked the teacher to summarize her daily worm removal data for the past 6 weeks and complete the Motivational Assessment Scale (MAS, Durand, 1988) and the Problem Behavior Questionnaire (PBQ, Lewis, Scott, & Sugai, 1994). These teacher-report scales are designed to identify the function of inappropriate behaviors. Finally, they scheduled subsequent activities.

Problem Analysis

The consultant completed three, 1-hour, antecedent-behavior-consequent (A-B-C) observations using narrative recording in Ben's classroom (see Skinner, Rhymer, & McDaniel, 2000) and collected and scored the MAS (Durand, 1988) and PBQ (Lewis et al., 1994). Next, the consultant completed three, 45-

90 min direct observation sessions. During these sessions the consultant recorded frequency counts for each time Ben received individual teacher attention (defined as teacher approach and verbal interaction with Ben) when he was engaged in appropriate behavior and each time he received attention when he was engaged in inappropriate behavior.

During the problem analysis interview the consultant and teacher reviewed the A-B-C, MAS, PBQ, and frequency count data to discuss the possible functions of Ben's behavior. The MAS and PBQ indicated that teacher attention was reinforcing Ben's inappropriate behaviors. The A-B-C narrative recordings indicated that Ben's disruptive behaviors were frequently followed by "negative" teacher attention including reprimands, re-directions, and worms removed and associated consequences (e.g., lost privileges, parents informed of disruptive behavior). The frequency count data showed that Ben never received attention when he was engaged in appropriate behavior, but received attention 13 times when he was engaged in inappropriate behavior. Based on these data, the teacher and consultant concluded that "negative" teacher attention (e.g., reprimands, re-directions, instructions to remove one of his worms) was reinforcing Ben's inappropriate classroom behaviors.

During the problem analysis interview the teacher and consultant used these FBA data to develop an intervention. First, FBA which indicated that Ben's inappropriate behaviors were being reinforced with teacher attention (e.g., warnings, reprimands, re-directions, instructions to remove a worm) supported the application of a variety of strategies designed to increase rates of attention delivered when Ben was engaged in appropriate behaviors. One empirically validated strategy that is consistent with the FBA is delivering higher rates of labeled praise when the student is engaged in desired behavior, while attempting to reduce attention when he is engaged in undesired behaviors (Bernhardt & Forehand, 1975; Bernhardt et al., 1978; Gillat & Sulzer-Azaroff, 1994; Herschell et al., 2002). While such interventions were consistent with the FBA data and previous research, the specifics of the intervention were altered based on a deeper analysis of FBA data.

As the consultant and teacher reviewed and discussed the FBA data the teacher asked *why* Ben responded to (e.g., warnings, reprimands, re-direction, instruction to remove a worm) in such an atypical manner (e.g., these attempts to punish behavior appeared to work for other students). Although this question was never answered, it did lead to a discussion of Ben's learning history, which produced a hypothesis that in the past, when presented with directions or rules (stimuli), Ben was reinforced for engaging in the opposite behavior (not following the direction or breaking the rule) via the delivery of "negative" attention (e.g., reprimands). Based on this posited learning history, the consultant and teacher decided against increasing attention to Ben contingent upon desired behavior via the application of labeled praise. Given Ben's learning history, they posited that increasing the salience of the contingency with labeled praise may occasion or increase Ben's inappropriate behaviors. Instead, they developed a plan designed to increase teacher attention when Ben was engaged in desired behavior that did not draw attention to the contingent relationship between the attention and Ben's desired behavior (e.g., decrease the salience of these discriminative stimuli). Thus, when Ben was behaving appropriately, the plan was for the teacher to increase her rates of attention in a manner that did not highlight the contingent relationship between the attention and behavior (e.g., pats on the back, complimenting Ben's clothes).

Plan Implementation

In accordance with the intervention plan, each day, the teacher affixed a sticky note to her school identification badge to remind her to provide attention to Ben when he was engaged in desired behaviors. Throughout the day, she recorded each instance she attended to Ben when he was engaged in desired behaviors, without drawing attention to the contingency, by writing a slash on this sticky note. She summed the slashes each day. These self-monitoring procedures were designed to assess and enhance treatment integrity (Johnson & Bolstad, 1973).

Intervention Evaluation and Incidental Experimental Design Elements

The teacher had been recording the number of worms lost each day for the entire year. The previous 6 weeks (28 school days) served as the initial baseline data. This measure was selected for several reasons. The teacher was already collecting these data; therefore, the procedure required no additional teacher time or resources. Furthermore, because Ben's disruptive behaviors occurred at unpredictable times throughout the school day, attempts to obtain a sample of Ben's disruptive behaviors would have required the consultant to observe the entire school day.

The first treatment phase lasted 11 consecutive school days. During this time, the teacher recorded a slash every time she provided attention to Ben when he was engaged in desired behavior. Again, this attention did not include verbal behavior that highlighted the connection between the attention and his behavior (e.g., no labeled praise). During this phase, worms were still removed contingent upon inappropriate behavior, and the teacher made no conscious attempt to reduce reprimands and other forms of attention contingent upon disruptive behaviors.

After 11 consecutive school days, the teacher and consultant met to evaluate treatment effects. As the treatment appeared to work, they hypothesized that perhaps they had decreased the reinforcing value of reprimand, re-directions, upsetting the teacher, and other forms of "negative" attention (Henington & Skinner, 1998; Reid, Patterson, & Snyder, 2002). Thus, they decided to withdraw the treatment and assess maintenance. During this withdrawal phase, the teacher did not place a sticky note on her badge and stopped consciously providing high levels of attention contingent upon Ben's inappropriate behavior. Because analysis of maintenance phase data showed that Ben was losing worms at a similar level to baseline, the intervention was reinstated. While this failure to maintain was discouraging, it did result in that application of an A-B-A-B withdrawal design that enhanced our ability to evaluate the intervention (Kazdin, 2004). As data indicated that Ben's behavior improved when the intervention was reinstated, the teacher continued the intervention for the remainder of the school year (about 1 month).

Treatment Integrity

To insure that the teacher was accurately recording instances of providing Ben with attention when he was engaged in desired behavior, experimenters observed the teacher for 45 minute intervals 2 or 3 times per week and made similar recordings. Across all observation sessions, the teacher's frequency counts equaled the observers' frequency counts. Furthermore, the teacher was never observed delivering labeled praising.

Results

Figure 1 displays the number of worms Ben lost per day across phases along with the number of times the teacher recorded attending to Ben when he was engaged in appropriate behaviors during the two treatment phases. During the first baseline phase, data were variable with an increasing trend in worms lost prior to implementing the intervention. During this phase, Ben lost an average of 1.15 (SD = 0.989) worms per day. Immediately following the application of the intervention (increasing levels of attention when Ben was engaged in desired behaviors), Ben stopped losing worms. In fact, during the first intervention phase (11 consecutive school days) Ben did not lose any worms. During the next phase (maintenance and/or withdrawal phase), Ben began to lose worms at a level similar to baseline ($M = 1$, $SD = 1.41$). As soon as the treatment was reinstated, Ben stopped losing worms (3 consecutive school days of no worms lost). Across both intervention phases the teacher's daily tallies of her attention when Ben was engaged in desired behavior averaged 6.28 instances per day, ($SD = 1.27$, range = 4 – 8).

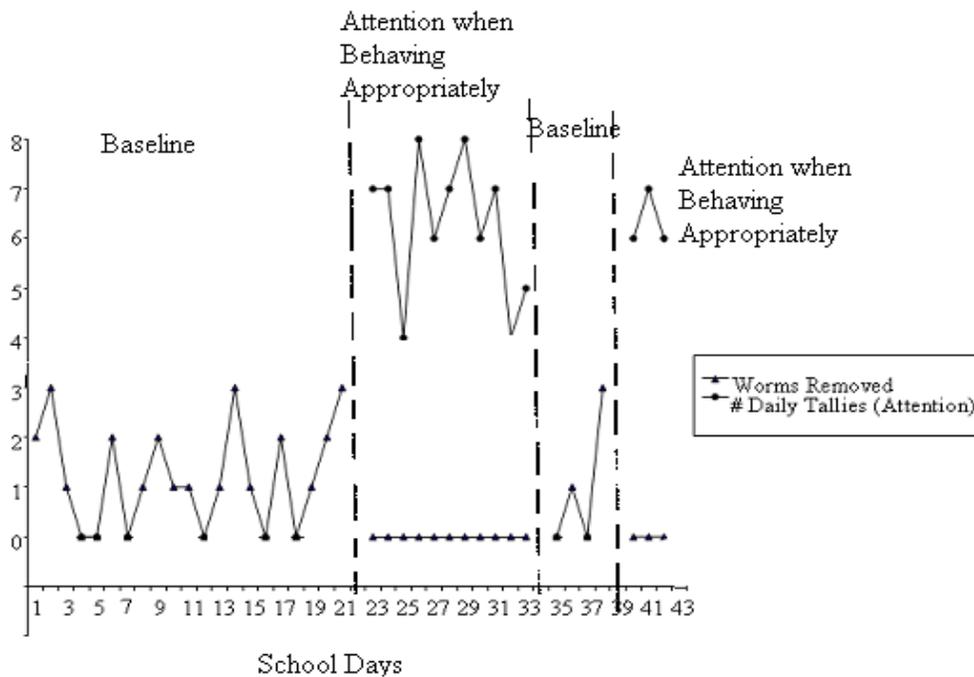


Figure 1. Worms lost across phases and teacher-recorded instances of attention delivered when Ben was behaving appropriately during treatment phases.

Discussion

This consultation case supports both the interventions effectiveness and the behavioral consultation models of service delivery. Any evidence-base supporting remediation procedures should have evidence of internal, external, and contextual validity (Detrich, Keyworth, & States, 2007; Kazdin, 2008; Schoenwald & Hoagwood, 2008; Shriver, 2007; Skinner & Skinner, 2007). Although A-B-A-B designs can provide powerful evidence of cause-and-effect relationships, (Kazdin, 2004) there are several weaknesses associated with the current study that threaten its internal validity.

Because the current procedures were implemented to remedy a problem, no interobserver agreement data was taken on the dependent variable (worms removed). There are several reasons why this is a serious concern. It is difficult for teachers to administer class-wide independent response-cost systems with integrity (Fudge et al., 2007; Henington & Skinner, 1998; Repp & Singh, 1990). Thus, we cannot be sure that the changes in worms lost were caused by reduction in Ben's disruptive behaviors or the teacher altering her removal-of-worms behavior after the intervention was applied. The intervention may have caused the teacher to become more cognizant of Ben's appropriate behaviors and enhanced her perceptions of Ben (Skinner, Cashwell, & Skinner, 2000; Skinner, et al., 2002), which influenced the teacher to alter her criteria for removing worms (became less strict). One factor which suggests that teacher expectations and/or perceptions did not influence data collected is the return of worms lost during the second A phase when the teacher expected that the intervention effects would be maintained.

Although the failure to verify the quality of our measures means that the current data do not provide a clear demonstration of a cause-and-effect relationship, they do provide *evidence* that the intervention was effective (Barlow & Hersen, 1984; Skinner & Skinner, 2007). Therefore, the current consultation case may have heuristic value as future researchers could address this limitation by having

blind observers collect disruptive behavior data and by having a second observer simultaneously collecting interobserver agreement data (Skinner, 2004).

Evidence of contextual validity suggests to teachers that the procedures can be applied and sustained in their classrooms (their context) without causing negative side-effects including disrupting other routines, aversively affecting other students' academic and social behavior, and/or hindering the effectiveness of other programs (Kazdin, 2008; Schoenwald & Hoagwood, 2008; Skinner & Skinner, 2007). The current intervention required little training, few resources, little teacher time, and sustainability was demonstrated by the teacher's re-application of the intervention after the withdrawal phase and continued application of the intervention after the consultation case was closed. Other acceptability data included teacher reports during the plan evaluation interview when she indicated that the intervention was very easy to implement and that it "was not a problem to add to her day as it took no time to just make a mark on the sticky note". During follow-up (3 weeks after the last data point was collected), the teacher contacted the consultant to inform her that Ben was still doing well and that she was still implementing the intervention. These data support the contextual validity of the intervention and suggest that the teacher found the intervention acceptable. However, we have no indication of student acceptability as the intervention was designed in a manner to decrease its salience, in order to avoid oppositional/defiant behavior.

One difficult aspect of intervention implementation reported by both the teacher and the consultant was developing and applying attention that did not make the link between the attention and Ben's desired behaviors more salient. It has often been said that we reinforce behaviors not students and many human service professionals are trained to apply social reinforcement for desired behaviors with procedures such as labeled praise. Therefore, when a student is behaving as desired, the tendency is to praise that behavior (e.g., "Nice job following directions"). In this instance, the teacher and consultant were challenged to develop procedures for delivering attention that did not include such procedures with comments such as, "nice shoes, Ben."

The current study provides additional evidence that behavioral consultation procedures can be used to identify problems and generate data that lead to the development of successful remediation procedures. Perhaps, the most important contribution of the current case is how the consultant and teacher used their FBA data to make specific and detailed decisions regarding intervention development. While behavioral psychology and the application of FBA procedures can appear simple (e.g., identify the function and choose an intervention from a list), behavioral theories and processes are complex. Educators are frequently advised to strengthen the impact of their social praise by making the connection between desired behaviors and rewards more salient by applying procedures such as labeled praise (Bernhardt & Forehand, 1975; Bernhardt et al., 1978; Gillat & Sulzer-Azaroff, 1994; Herschell et al., 2002; Kazdin, 1994; Madsen et al., 1968). In the current case, both the consultant and teacher were aware of these recommendations and discussed this option. However, because their analysis went beyond function (i.e., what is currently reinforcing undesired behavior) and included forming hypotheses regarding Ben's learning history, they decided to violate the commonly recommended procedure of applying labeled praise. This finding may encourage practitioners to conduct more in-depth analysis of their data (e.g., "What learning history do these data suggest?") when attempting to develop interventions.

Conclusion

Consultation case studies rarely meet the rigorous requirements needed to firmly establish internal validity. However, such cases can have strong heuristic value and provide direction for future research (Skinner, 2004). Interventions developed and evaluated during consultation (see Campbell & Skinner, 2004) can influence others (see Yarbrough, Skinner, Lee, & Lemmons, 2004) to replicate and extend these evaluations using scientific procedures to validate the findings from the previous

consultation case. Similarly, problem solving procedures, theories, and concepts developed during consultation cases can advance our field by influencing others to conduct more in-depth, scientific evaluations of these practices and concepts.

In the current case, the decision to apply differential attention in a manner that did not highlight the contingent relationship between the behavior and attention was based on a hypothesis that provides clear direction for future researcher. Researchers should compare the effects of two types of intervention across two groups of students. Specifically, researchers should compare enhancing attention that highlights the link between the behaviors and the attention (e.g., labeled praise) with attention that does not highlight this relationship (procedures used in the current study) across students for whom negative attention (e.g., reprimands) is reinforcing and students for whom negative attention is not reinforcing. Such research may show that procedures designed to highlight contingencies (e.g., labeled praise, contingencies contracts, token economies, response-cost systems) are less effective or have an adverse effect when students have a history of reinforcement for rule breaking, as opposed to rule following behavior. Such findings may have theoretical implications related to oppositional-defiant behavior, coercive relationships, power struggles, and non-contingent reinforcement (Hagopian, Fisher, & Legacy, 1994; Henington & Skinner, 1998; Jones, Drew, & Weber, 2000; Reid, et al., 2002) and applied implications in that, if confirmed, they would enhance consultants' and/or consultees' ability to link assessment to intervention procedures.

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An additional one time layout/composition fee of \$25.00 is applicable

In addition to placing your ad in the journal(s) of your choice, we will place your ad on our website's advertising section.

For more information, or place an ad, contact Halina Dziewolska by phone at (215) 462-6737 or e-mail at: halinadz@hotmail.com