USING A BEHAVIORAL TREATMENT PACKAGE TO TEACH TOLERANCE TO SKIN CARE PRODUCTS TO A CHILD WITH AUTISM:

A SYSTEMATIC REPLICATION

Tania A. Vidosevic, B.A.

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APPROVED:

Sigrid Glenn, Major Professor
Janet Ellis, Major Professor
Manish Vaidya, Committee Member
Richard G. Smith, Chair of the Department of Behavior Analysis
Thomas L. Evenson, Dean of the College of Public Affairs and Community Service
Michael Monticino, Interim Dean of the Robert B. Toulouse School of Graduate Studies
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The purpose of this study is to investigate the effectiveness of a treatment package to teach a child with autism to willingly accept skin care products conducive to health and normal everyday living. The current study uses graduated exposure, modeling and contingent social attention to teach the child to accept the application of skin care products previously avoided. Results of the study showed that the participant tolerated criterion amounts of all target stimuli with both experimenter and parent. Follow-up probes revealed maintenance of the behaviors with only two out of the three target skin care products.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIST OF FIGURES</td>
<td>iv</td>
</tr>
<tr>
<td>INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>METHOD</td>
<td>6</td>
</tr>
<tr>
<td>RESULTS</td>
<td>17</td>
</tr>
<tr>
<td>DISCUSSION</td>
<td>20</td>
</tr>
<tr>
<td>APPENDICES</td>
<td>28</td>
</tr>
<tr>
<td>REFERENCE LIST</td>
<td>43</td>
</tr>
</tbody>
</table>
LIST OF FIGURES

Figure 1: Portioning Cue Card.................................................................24

Figure 2: Participant Performance on Hierarchy of Steps for 3 Products with Mother and Therapist.................................................................25

Figure 3: Positive Responses for 3 Products..............................................26

Figure 4: Negative Responses for 3 Products.............................................27
INTRODUCTION

Aversions to various stimuli are a normal part of development for many individuals. However, extreme aversions to common stimuli can interfere with daily functioning. Matson (1981) operationally defines fears as maladaptive when they continue over an extended period of time and when the response to the feared stimulus is unreasonable given the amount of actual danger present. Commonly observed fearful or avoidance behaviors of children may include whining, negative statements, physical resistance, removal of the stimulus, and crying. These affective and avoiding behaviors can interfere with daily functioning when they occur in response to stimuli often present in the everyday life. An example of this would include avoidance of sunscreen by a child who loves to play outdoors.

Individuals with developmental disabilities often exhibit avoidance behaviors in the presence of stimuli that do not typically evoke avoidance in the general population. The Diagnostic and Statistical Manual of Mental Disorders (DSM IV-TR) includes “odd responding to sensory stimulation” (p. 72) as one of the behavioral symptoms associated with autism (American Psychiatric Association, 2000). Some examples of these responses listed in the DSM IV-TR include: “high threshold for pain, oversensitivity to sounds or being touched, exaggerated reactions to light or odors, and fascination with certain stimuli” (p. 72). Hagopian and Jennett (2008) also cite research which suggests that individuals with disabilities may be at increased risk for the development of anxiety disorder.
Although the body of literature to treat avoidance behaviors in children with autism is limited, there is much evidence that behavioral treatment packages can produce positive outcomes. Jennett and Hagopian (2008) reviewed the literature regarding behavioral treatment of phobic avoidance. The authors reviewed 13 single case studies and 4 group studies to evaluate treatment efficacy of behavioral treatment packages. The authors used criteria described by Division 12 and Division 16 of the American Psychological Association for evaluation of empirically supported interventions. Jennet and Hagopian identified common components in the studies as in-vivo exposure, stimulus hierarchies, contingent reinforcement, prompting, modeling, extinction/blocking, and the use of distracting stimuli. Of the 13 single case design studies published between 1981 and 2006, 12 demonstrated treatment efficacy. Of the 4 group designs (published between 1970 and 2002) included, 2 demonstrated significant differences between treatment and no-treatment control groups. Results showed that all studies considered to have good experimental designs and demonstrating effective treatment were those that employed in vivo exposure to the avoided stimulus coupled with reinforcement for acceptance. The authors concluded that there is sufficient evidence to support the use of behavioral treatment for phobic avoidance for individuals with developmental disabilities.

For present purposes, we focused on studies using graduated exposure and reinforcement. Rapp et al. (2005) conducted a study which evaluated and treated swimming pool avoidance in a 14-year-old girl with autism. Upon approaching pools the girl exhibited various avoidance behaviors including elopement, screaming, flopping, face-hitting, and choking. Treatment included blocking for elopement and flopping, and
reinforcement for movements toward the pool and for movement toward increasing depths. A series of reversals were used to evaluate the intervention to decrease the girl’s problem behavior. Swimming pool avoidance was treated over 12 sessions within an 8-week period. Treatment outcomes were generalized with the mother and in an untrained setting.

Ricciardi et al. (2006) used in-vivo exposure with an 8-year-old boy diagnosed with autism. The child’s behaviors included screaming, trying to run away, and aggression toward people who blocked him from escaping the animatronic toys. A 5-step treatment hierarchy was implemented in which reinforcement was made contingent on remaining at decreasing distances to three animatronic toys. Differential reinforcement for approach responses was used without escape extinction. The results showed that the child was able to remain at criterion distances to the previously avoided toys as well as touch them upon the therapist’s request. Follow-up with the parent at 3 months post-treatment showed that although the child occasionally protested the presence of animatronic objects, he no longer attempted to escape.

A study conducted by Love et al. (1990) successfully treated avoidance behaviors of two children with autism, ages 4 and 6, using graduated exposure, and modeling with parents serving as therapists. One child exhibited avoidance behaviors in the presence of running water in the shower and the other avoided going outside alone. Social and tangible reinforcers were delivered by the parent-therapist contingent on the children observing the modeled approach response, engaging in the approach response with the parent, and completing the modeled approach independently. Hierarchy of exposure steps
included increasing distances from the house for the child who avoided going outdoors alone and increasing duration in the presence of running water in the shower. Both children were able to tolerate the previously avoided situations after fewer than 40 sessions of treatment.

South (2001, published as Ellis et al. in 2006) used graduated exposure, modeling, and contingent social attention to teach tolerance to various skin care products with two children with autism. Two male children with autism, both age 4, exhibited intolerance to skin care products. Both children were gradually exposed to skin care products within a treatment hierarchy. For one child, the target skin care product was lotion. For the other child, a multiple baseline design was used to evaluate the treatment of three different products: suntan lotion, antibiotic cream, and baby lotion. Modeling was used if the children failed to engage with the product appropriately at any step in the hierarchy. Social reinforcement was delivered following each completed step. One child’s mother also served as therapist by implementing generalization probes during baseline, treatment and post treatment. Dependent measures included completion of the target step (acceptance of the skin care product) as well as negative and positive affective responding during the trials. Negative and positive responses included physical, verbal, vocal and facial expressions. Both children in the study showed increased tolerance to skin care products. Also, both children showed decreased negative responding and increased positive responding. The study supports previous research in the use of in vivo desensitization, modeling, and social reinforcement as part of at treatment package to teach children with autism to tolerate objects previously avoided before treatment.
The present study was designed to replicate and extend the generality of the procedures used by South (2001) to teach a child with autism to tolerate skin care products. Graduated exposure to increasing amounts of skin care products was employed together with social reinforcement and modeling. An individualized treatment hierarchy was established and implemented based on participant responding.
METHOD

Participant

The participant was an 8-year 11 month old boy diagnosed with autism who attended a 30 hour/week applied behavior analytic special education program at a private school for children with autism and related disorders. The participant also received behavioral services in the home through an outreach program. He was selected to participate following parental response to a recruitment letter searching for possible participants with aversions to skin care products.

Setting and Materials

The study took place in the participant’s home. Treatment and probes of the various products took place in the family’s bathroom. The bathroom was furnished with two adjacent sinks with mirrors in front of them, a toilet, a shower, and bathroom linens. A video camera was also present in the room, as were skin care products targeted in the study, as well as various bathroom accessories (not relevant to the study) belonging to the participant and other family members. Materials included target skin care products identified by the parent as aversive for her son. The following three products were identified and chosen by the experimenter and the parent as treatment targets: face lotion, sun block, and face wash. Additional materials included various toys and preferred items available during breaks and a cue card used by the experimenter and the mother to apportion the amounts of skin care products (see Fig. 1). A visual schedule was also used to show the participant when breaks would occur. During baseline sessions and the first
treatment session the visual schedule consisted of a list that read “Lotions with Mommy/Therapist,” followed by the word “Break” presented repeatedly in the list. The participant or therapist would cross off the activity once completed. In the second treatment session of the study, the letters that spelled the word “Break” were delivered, one for each correct response on each trial.

Trial presentations were videotaped and viewed post session by the experimenter. The experimenter recorded the step in the hierarchy for each trial that was presented, the occurrence or non-occurrence of both negative and positive responses within the trial, and whether or not the participant completed the step (see Appendix A for list of behavioral definitions). Data collection also included descriptive data relevant to each trial (see Appendix B for sample data sheet).

**Experimental Conditions and Procedures**

The study reported here is a replication and expansion of previous research reported by South (2001). Materials, definitions, and procedures were replicated whenever possible. All sessions were video-recorded. Variations in the procedures and data collection were due to individualization of the treatment for the participant in this study.

A multiple baseline design was used to evaluate the effects of graduated exposure, modeling, and social praise on the participant’s tolerance of skin care products. Duration of the sessions ranged from 30-60 min. Breaks occurred throughout the sessions and took place in various areas of the home where the child had access to a variety of preferred activities.
Baseline trials were conducted with the parent, the experimenter, and both together, to evaluate the participant’s pre-treatment responding to the various products and to develop an individualized hierarchy of treatment exposure. In baseline trials a product was presented and the participant was instructed to apply it. If the participant did not apply it independently, physical assistance was used. Step completion at final criterion consisted of the target behavior of voluntarily applying or tolerating the application of an appropriate amount of skin care product on the child’s face without any negative responding. Negative responding included verbal, vocal, and physical behavior. Negative responding during baseline was then clinically evaluated to determine appropriate treatment hierarchy. Access to breaks was granted baseline (non-contingent on responding) and after repeated presentation of the products.

An individualized treatment hierarchy for each product was established based on the participant’s responding during baseline. Face lotion was chosen as the first product to introduce due to fluidity of the product as well as the participant’s limited previous exposure to that particular product (see Appendix C for product hierarchies). Treatment with the face lotion began with the initial step in the treatment hierarchy. On each trial, the target amount of product was presented and applied to or by the participant. Modeling was used during the trial if the participant did not immediately apply the product as directed. Vocal statements such as, “We’re going to rub it all in” or “Look, we are going to make it disappear” were also used to aid in the application of the product. The participant was physically assisted with product application if he did not apply the product effectively. Social attention in the form of vocal praise, smiles, and high-fives
was given contingent upon appropriate application of the product during the trial and following each completed step. If a negative response occurred, the trial ended and the previously mastered step size was presented.

If the participant completed two consecutive trials at any step, with no negative responding, the experimenter moved on to the next step within the hierarchy. If the child engaged in any of the listed negative responses, the trial ended and the previous step was presented. Likewise, the same two-step advancement criterion was employed before the child moved up in the hierarchy. On two occasions the treatment hierarchies were modified and steps were added. Step 5 and Step 12 were added to the face lotion hierarchy and then to subsequent skin product hierarchies after the experimenter decided that a reduction in the amount of product between steps would increase the likelihood of successful responding.

The participant was given breaks throughout the session contingent on correct responding for varied numbers of trials (see Appendix D for a typical training session). Breaks consisted of varied amounts of time during which the participant had access to preferred activities with the experimenter and/or parent.

The experimenter reviewed the videotapes after each session and trial-by-trial data were collected on acceptance or avoidance of the products (see Appendix B for sample data sheet). The experimenter recorded whether or not the steps within the hierarchy were completed as well as the occurrence or non-occurrence of negative or positive responses emitted during the trial. On three occasions the negative responding was observed in post-session review of the videotape in which the negative response was
erroneously reinforced. In Session 5, the negative response occurred mid-session at Step 11; however, the experimenter did not observe this response in vivo but presented the step over three trials instead of two. The second occurrence of unobserved negative responding in vivo occurred on the last trial of the Session 5 at Step 13. The following session began at the previously mastered Step 12. The final post session negative response observation occurred in Session 29 during the probe for face wash with the parent. The face wash probe was erroneously reinforced by the parent, and generalization training was initiated in the following session.

Once the participant reached criterion on the final step within the hierarchy over two trials for a product, generalization probes were conducted at criterion steps with the mother. If the child did not complete both generalization probes at final criterion with the parent, generalization training through the hierarchy began with the parent and experimenter present. Following initial treatment with the first product, the subsequent treatments and generalization training consisted of accelerated advancement through the hierarchy of steps. Decisions on where to begin within the hierarchy as well as how quickly to advance through the hierarchy were based on clinical judgment. During generalization training the parent was instructed to present trials in the same manner as the experimenter. Instruction of trial presentation for the parent included viewing successful videotapes of final criterion steps, review of the negative response definitions, and mock trials with the experimenter playing the role of the child. Follow-up probes were conducted post-treatment for each product with both the experimenter and the parent to test for maintenance of the target behaviors.
During baseline the most frequent negative response was wiping away the products with a variety of items including various towels in the bathroom and the terry cloth shower curtain. Therefore, the first step of the treatment with the experimenter was initiated in the absence of towels in the bathroom. When Step 3 in the hierarchy was repeated the experimenter modified the setting by removing the shower curtain. The towels and shower curtain were then added again at final criterion during Sessions 9 and 10 and were present on all subsequent trials.

Following Session 6 in which the participant had repeated negative responses, one at Step 15 and one at Step 12, it was noted that repeated trials during a single session at criterion amounts led to accumulation of the product on the participant’s skin. This was thought to influence the likelihood of negative responding and would not occur in the everyday environment. Further sessions occurring near or at criterion were conducted as single-trial presentations or were presented with extended breaks between trials. Criterion steps in Sessions 7-10 of the face lotion were presented in this manner following the revision, and the participant completed treatment with the experimenter using that product.

Following treatment with the face lotion, the experimenter presented two trials with sunscreen in criterion amounts. Final criterion amounts of sunscreen were at size #3 (rather than #5 as for the face lotion) due to the higher viscosity of the product. It was determined that sunscreen size #3 was a sufficient amount to cover the participant’s face completely. Treatment began through the hierarchy with the sunscreen following the second trial during which the participant did not complete the step. Movement through
the hierarchy progressed from Step 6 to Step 11 then to Step 13 (final criterion). The participant was able to complete treatment for the sunscreen with less frequent sessions and with fewer total trials than with the initial face lotion product.

Following completion of face lotion and sunscreen treatments with the experimenter, sessions were interrupted by a 2-week break. Upon return to the experiment, a probe with the parent was conducted using the face lotion, and a negative response occurred at the final criterion step. Therefore, generalization training through the hierarchy was conducted with the parent and child. Generalization training consisted of the parent presenting the trials in the same manner as the experimenter with the exception of Steps 6 and 13 during which the parent presented the trial only once. This did not affect treatment outcome as the participant continued to accept the product until reaching final criterion.

Next, generalization probes for the sunscreen were conducted. On the second trial presentation at criterion for the sunscreen the child did not complete the step, and generalization training with the parent began. The movement through the hierarchy during generalization training with the sunscreen matched that of the initial training with the experimenter.

Following generalization training with the parent for sunscreen, treatment began with the experimenter for face wash, the final product. The topography for appropriate application of this product differed from that of the previous products. The participant was taught to distribute the product in the same manner as with the previous lotions, but was required to rub it over his face and then rinse it off. The participant was instructed to
use a towel to dry his face after rinsing. Due to experimenter error probes were not conducted before implementing treatment; however, the child had a negative response on the third trial with the face wash, evidence that mastery at final criterion would have been unlikely. Treatment with the experimenter began with the face wash Step 11 and revisions were made to include using a face cloth following rinsing of the product to ensure any remnant of the product was removed completely. A negative response to this product included the child wiping away the product with the dry towel before it was completely rinsed off.

Following treatment with the experimenter, a probe was conducted with the mother for the face wash and generalization training followed because the participant did not complete the step. The negative response for this trial was noted post session upon review of the video and was erroneously reinforced during the session. Once again, generalization training with the face wash consisted of accelerated presentation of steps through the hierarchy. During Session 30, the participant repeatedly dripped water on his shirt and wanted to remove it. A revision was made to the trial presentation after suggestions from the parent that the child remove his shirt before washing his face. During Session 31, following a negative response at Step 13, the experimenter told the parent to remain at the step because the negative response occurred following the child getting water on his stomach and drying it with a towel. The child then proceeded to dry his face with the towel before washing away the product with water. The following 2 trials were correct, and advancement through the hierarchy continued until mastery occurred at final criterion.
Follow-up probes with all products were conducted following the generalization training phase. Follow-up probes were conducted both with the participant and the mother. Follow-up probes for the face lotion and sunscreen conducted during the treatment and generalization phase of the face wash occurred just prior to training with the face wash. When the child tolerated the application of the product he was allowed access to an extended break. Extended breaks were given following product application to increase the amount of time that the child left the product on before beginning training with the face wash. If the participant did not tolerate the face lotion or sunscreen application, trials for the face wash began immediately. Once generalization training for the face wash was complete, follow-up probes for all products were conducted with extended breaks between trials on which correct responding occurred. Incorrect responses during follow-up probes were either succeeded by a probe for another product or the arbitrary task of putting away towels in the bathroom. The letter was given to complete the word “break” after completing the task so that the participant would have a break even if he did not emit the target response in the follow-up probes.

Five follow-up probes for the face lotion were conducted at 15, 24, 55, 70, and 71 days following completion of generalization training with the parent. The participant tolerated application of the face lotion on the first probe with the experimenter, again on the second probe with the parent and experimenter in view, and again on the third probe with the parent. During this third probe the parent did not deliver a letter for correct responding. On following fourth probe with the parent the participant did not tolerate the
application, but tolerated it with the parent on the fifth probe. The participant tolerated a total of 80% of the follow-up probes for the face lotion.

Five follow-up probes for the sunscreen were conducted at 9, 26, 35, 50, and 62 days following completion of the generalization training with the parent. The participant tolerated application of the sunscreen on the first probe with the experimenter, and again on the second probe with the parent and experimenter in view. The third probe was conducted with the experimenter again, and the participant tolerated the application. On the fourth probe with the parent the participant did not tolerate the application of the sunscreen; presentation of the arbitrary task did not follow, and no break was delivered. On the fifth probe with the mother and experimenter out of view the participant tolerated application of the sunscreen.

Four follow-up probes for the face wash were conducted at 7, 18, 21, and 30 days following completion of the generalization training with the parent. The participant did not successfully complete the step on the first probe with the experimenter or on the second probe with the parent. The third probe was conducted with the parent again, and the participant completed the step. On the fifth probe with the parent the participant did not complete the step.

**Interobserver Agreement (IOA)**

Interobserver agreement (IOA) by review of the tapes was assessed by a graduate student familiar with the child. During IOA training negative and positive response definitions were reviewed with written examples and non-examples of the behaviors. Trial-by-trial data were evaluated by the observer for 33% of each of the treatments and
100% of the baseline and post-treatment probes. The observers did not compare recordings until after data collection was complete. Mean IOA for negative responses was 93% ranging from 67-100%. Mean IOA for positive responses was 74% ranging from 25-100% (see Appendix D for tables). Treatment integrity data were collected on 33% of each phase of the training. Trial-by-trial data were evaluated by the same observer as listed above. Mean treatment integrity was 97% ranging from 83-100% (see Appendix E for tables).
RESULTS

The results for each product are shown in Figure 2. The graphs depict performance on each step of the hierarchy for each product (see Appendix B for hierarchies). Open data points represent steps within the hierarchy that were not completed by the participant. Black data points represent steps within the hierarchy in which the participant completed the step without engaging in negative responding.

During baseline the child completed 2 (out of 6) face lotion trials with the parent and 0 (out of 9) with the experimenter. With sunscreen the child completed 2 (out of 6 total) trials with the parent and 1 (out of 9) with the experimenter. With face wash 0 (of 6) trials were completed with mother and 1 (out of 9) trials were completed with the experimenter.

The participant met criterion for each product during treatment and generalization training phases. Treatment with the first product required more trial presentations than were needed for subsequent products. However, all products required both treatment and generalization training. Generalization training with the parent required fewer trials than treatment phase for the face lotion. Generalization training with the sun screen matched the number of trials necessary for mastery in the treatment phase. Treatment for the face wash required more trials than the sunscreen treatment for both treatment and generalization training. This may have been due to the difference in the topography of the target response. The child was required to perform a longer series of steps with the face wash than was required for the previous products including splashing it off with water,
wiping with a washcloth, and drying his face with a towel. Follow-up probes with the experimenter and mother indicated that these behaviors were maintained for the face lotion and sunscreen, but not for the face wash.

Figures 3 and 4 depict positive and negative response occurrences and non-occurrences/trial for each product in each phase of the study. The participant engaged in a greater proportion of positive responses for each product during treatment, generalization, and follow-up than were observed during baseline. Negative response graphs show that the participant had proportionally fewer negative responses for each product during treatment, generalization, and follow-up as compared to baseline.

The mother completed a social validity questionnaire after all treatment and follow-up probes were conducted. Questions followed the general form of those in South (2001) but open ended questions were modified and tailored to the parent’s interest in the study (Appendix F). The participant’s mother rated the goal of treatment as “very important” (1 on a 5-point scale). Satisfaction with the outcome was scored as 2 on a 5-point scale (with 1 being very satisfied and 5 being not satisfied). Parental report also rated that importance and satisfaction with method used in the study as 3 on the 5-point scale. The mother reported that it was both meaningful for her child and for the family to have him participate in the study, as it has been an important goal for him to successfully learn to tolerate products on his face that are necessary for daily cleaning purposes and for sun protection. Suggestions for improvements to the study included the possibility of prompting a correct response when negative responding occurred, specifically with the face wash target. The mother identified that negative responding during face wash trials
may have been a result of the child not understanding the washing response requirement following face wash application and not difficulty tolerating the application.
DISCUSSION

The results of this study support the previous research showing that graduated exposure, modeling, and contingent social reinforcement can be an effective behavioral treatment program in teaching tolerance to skin care products for two out of three products in a child with autism. Although the participant of this study exhibited mild avoidance responding compared to the participants in South’s (2001) study, the results show an increase in tolerance to two of the skin care products as well and an overall increase in positive response occurrences/trial for each of the phases: treatment, generalization training, and follow-up. This is significant when considering the importance of developing behavioral treatments that are enjoyable for children.

The adaptations in procedures used in the current study were adapted from those used by South (2001) in the following ways: The in-vivo exposure hierarchy was developed to target the tolerance of increasing amounts on the participant’s face. Unlike the participants in the earlier study, the participant in this study tolerated the application of some of the products on some of the baseline trials. Although he engaged in negative vocal and verbal responses, he most often engaged in the negative physical response of wiping off the product. The target performance herein was that the participant tolerates increasing amounts of the products in accordance with sizes displayed on the visual cue card. One limitation of this study would include the need for estimating the amount of product when using a visual cue card. There may have been slight variability in the amounts used based on the 2-D visual card. A more appropriately controlled product
amount application may have been possible by using a lotion dispenser that could be regulated to dispense exact incremental amounts of the skin care products.

The current study also differed procedurally from the study by South (2001) in that advancement through the hierarchy was dependent on correct responding over two trials at each step; whereas, in the previous study advancement through the hierarchy progressed if no negative responding occurred during a single trial presentation. Also, in the South (2001) study the experimenter remained on a step in the hierarchy if only one negative response occurred and moved to an easier step if more than one negative response occurred. This differed from the current study in which an easier step was presented after only one occurrence of a negative response. Occasionally in the South (2001) study the experimenter remained on steps in the hierarchy based on the difficulty or qualitative difference from the previous step. The current study attempted to establish a treatment hierarchy that procedurally would lead to more systematic changes in exposure across steps in the hierarchy.

The current study implemented three target products. The sunscreen and face lotion were similar in the application. The face wash differed in the application and washing requirements. The face wash required washing off the product and then drying of the child’s face. The participant may have found it difficult to discriminate when it was acceptable to wipe off his face. This target also added the features of splashing water on the participant’s face and washing his face with a washcloth. It is possible that these additional components were also affecting tolerance of the product as this participant’s aversions were very often to products that specifically applied to his face. However, steps
of the treatment hierarchy allowed for systematic increases in both the face wash product and amount of water necessary to remove it. As the participant progressed through the hierarchy, he was applying more of the product and, therefore, needed more water to wash it off. The inclusion of the face wash as a target product may have added to the limitations of this study due to the difference in response requirements for tolerating this product. Whereas face lotion and sunscreen required the participant to tolerate the application and leaving the product on his face (and specifically, not wiping it off), the face wash response required the participant to wash then wipe his face.

Face wash responding was also not maintained in follow-up probes. Follow-up probes for face wash suggested that a maintenance plan may be necessary to maintain responding. One possibility for such a plan could include re-exposure through the hierarchy contingent on negative responding. This, however, would require support from a therapist with the parent when implementing a maintenance plan.

Evaluating aversions to stimuli for children with autism can be difficult, because oftentimes these children do not have the verbal repertoire to identify which components of the stimulus are aversive. In the current study, if the child engaged in negative responding the trial ended and an easier step was presented. One could argue that this procedure allows for negative reinforcement of avoidance behaviors. Likewise, blocking was not used to interrupt escape responding. In this study the setting was modified to make escape responding less likely, but attempts to wipe were not blocked. It is unknown if the participant would have moved faster through the hierarchy had the experimenter blocked the escape response. However, if the participant was engaging in any avoidance
behaviors, these could be viewed as a step being too difficult. If escape responding was blocked it would have not been possible to evaluate whether or not the step was too difficult. Suggestions for future research could include the evaluation of the use of blocking/escape extinction vs. allowing escape responding for graduated exposure treatment packages.

Another limitation to the current study and how it differed from South (2001) study is that there was only one participant. Although the current research supports the use of graduated exposure, modeling and social reinforcement to teach skin tolerance to children with autism, the findings could have led to more information if more participants had completed the study. Considerations for future research could be to include a variety of participants.

In summary, the current study supports the previous research by South (2001) in which graduated exposure, modeling, and social reinforcement were used to teach tolerance to skin care products with a child with autism. Future research could consider possibilities in maintenance training, expanding the generality of the findings across more participants, and more controlled graduated exposure with products that accumulate on the skin.
Note: Size 6 for the face wash was portioned as two pumps of the wash (slightly larger than size 5)

Figure 1. Visual portioning cue card (actual size).
Figure 2. Participant performance on hierarchy of steps for 3 products with mother and therapist.
Figure 3. Positive responses for 3 products.
Negative Responses for Face Lotion

Negative Responses for Sunscreen

Negative Responses for Face Wash

Figure 4. Negative responses for 3 products.
APPENDIX A
RESPONSE DEFINITIONS
**Verbal responses** include words and phrases spoken by the child. Included are negative and positive responses occurring in the presence of the target stimuli. Tone and intonation may influence the scoring. “That’s enough?” while laughing and smiling may be recorded differently than, “That’s enough” while whining.

Negative: Any word or phrases expressing dislike including intonation and tone of voice.
- **Examples**: “Then, we’re going to be all done”, “No thanks”, “Not yet”. Incomplete sentences that begin with aggravated tone such as “Then…” . If the child is whining and makes a neutral comment like, “Not suppose to eat it” it will be recorded as a negative verbal response.

Positive: Any words or phrases expressing comfort, acceptance or enjoyment related to the treatment procedure.
- **Examples**: “Then we going to do some lotion” or “Time for Lotion with ______” If the child is smiling and laughing and makes an otherwise neutral comment like, “You’re not supposed to eat it”, will be recorded as a positive verbal response.
- **Non Examples**: echoing vocal instructions in a neutral tone, “This goes on your face” or neutral responses irrelevant to treatment, such as “Hi Mommy”

**Vocal responses** include noises or tone made with the mouth. Included are negative and positive responses occurring in the presence of the target stimuli.

Negative: Any sound expressing dislike or avoidance, or a tone or intonation that has high pitches and irregular intonation.
- **Examples**: Whining, crying, and making whining sounds during speech such as “EAAHHHHHH!”

Positive: Any sound expressing comfort, acceptance or enjoyment.
- **Examples**: Laughing, “EAHHHH”, “YEAH!!”
- **Non Examples**: coughing, sneezing, or vocal self-stimulatory sounds (ee-ee-ee-ee).

**Physical responses**: include bodily movements by the child (not included in the step requirements (for treatment) /or not in response to an instruction. Included are negative and positive responses

Negative: Any movement expressing dislike or avoidance.
- **Examples**: Wiping off stimuli, pushing stimuli away, physically resisting, leaving the area.

Positive: Any movement expressing comfort, acceptance, or enjoyment
- **Examples**: Reaching toward stimuli, touching stimuli, smiling
- **Non Examples**: reaching toward preferred items, sitting in the chair, tapping the table, physical self-stimulatory movements (repetitively jumping around room)
APPENDIX B

SAMPLE DATA SHEETS
Sample Data sheet including example data

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<th>Date</th>
<th>Session</th>
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<th>Pos Resp</th>
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<td>XX-XX-XX</td>
<td>Break</td>
<td>4 Total trial 4 (Session4-trial1)</td>
<td>STARTED SESSION W/O TOWELS Therapist places size 1 dab of lotion on child’s forehead while saying, “Dab on your forehead” or similar statement then “RUB IT ALL IN” and child rubs it in and leaves it on.</td>
<td>1-forehead</td>
<td>+ 0</td>
<td>+ Smiling laughing</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Break</td>
<td>(4-2)</td>
<td>Therapist places size 1 dab of lotion on child’s forehead while saying, “Dab on your forehead” or similar statement then “RUB IT ALL IN” and child rubs it in and leaves it on.</td>
<td>1-forehead</td>
<td>+ 0</td>
<td>+ Laugh Smiling</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Break</td>
<td>(4-3)</td>
<td>Therapist places size 1 dab of lotion on child’s forehead and size 1 dab of lotion left cheek and says, “Dab on your forehead and cheek” or similar statement and “RUB IT ALL IN” child rubs in forehead and left cheek and leaves it on.</td>
<td>1 forehead 1 cheek</td>
<td>+ 0</td>
<td>+ Silly Laughing Smiling Joking “don’t eat it!”</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Break</td>
<td>(4-4)</td>
<td>Therapist places size 1 dab of lotion on child’s forehead and size 1 dab of lotion left cheek and says, “Dab on your forehead and cheek” or similar statement and “RUB IT ALL IN” child rubs in forehead and left cheek and leaves it on.</td>
<td>1 forehead 1 cheek</td>
<td>+ 0</td>
<td>+ Smiling laughing</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Break</td>
<td>(4-5)</td>
<td>Therapist dabs size 1 dab of lotion on child’s forehead and size 1 dab lotion on left then size 1 dab of lotion on right cheek and says, “Dab on your forehead, on your cheek, and your other cheek” or similar statement and “RUB IT ALL IN” child rubs in forehead and left and right cheek (either simultaneously with both hands or one after the other with one hand)</td>
<td>1 forehead 1 lt cheek 1 rt cheek</td>
<td>-</td>
<td>1-Child uses towel to wipe away product off face + Silly Laughing Joking- “Don’t eat it!”</td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX C

SKIN CARE PRODUCT HEIRARCHIES
<table>
<thead>
<tr>
<th>Step</th>
<th>Size (portion) &amp; Location</th>
<th>Trial Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>size 1- forehead</td>
<td>Therapist places size 1 dab of lotion on child’s forehead while describing application (example: “Lotion on forehead” then “Rub it all in”) and child/therapist rubs it in and child leaves it on</td>
</tr>
<tr>
<td>Step 2</td>
<td>size 1-forehead size 1-cheek</td>
<td>Therapist places size 1 dab of lotion on child’s forehead and size 1 on left cheek while describing application (example: “Let’s put some lotion on forehead and dab on cheek” then “Rub it all in”) and child/therapist rubs it in and child leaves it on</td>
</tr>
<tr>
<td>Step 3</td>
<td>size 1-forehead size 1-left cheek size 1-right cheek</td>
<td>Therapist places size 1 dab of lotion on child’s forehead, left cheek, and right cheek while describing application (example: “Dab/Lotion on forehead, cheek, other cheek” then “Rub it all in”) and child/therapist rubs it in and child leaves it on</td>
</tr>
<tr>
<td>Step 4</td>
<td>size 1-forehead size 1-left cheek size 1-right cheek size 1-chin</td>
<td>Therapist places size 1 dab of lotion on child’s forehead, left cheek, right cheek, and chin while describing application (example: saying, “We’re going to put some on your on forehead, cheek, other cheek and chin” then “Rub it all in”) child/therapist rubs it in and child leaves it on</td>
</tr>
<tr>
<td>Step 5</td>
<td>size ½-forehead size ½-left cheek size ½-right cheek size ½-chin</td>
<td>STEP ADDED TO HIERARCHY Therapist places size ½ dab of lotion on child’s forehead, left cheek, right cheek chin, nose while describing application (example: saying, “Lotion on your on forehead, cheek, other cheek, chin and nose” then “Rub it all in”) child/therapist rubs it in and child leaves it on</td>
</tr>
<tr>
<td>Step 6</td>
<td>size 1-forehead size 1-left cheek size 1-right cheek size 1-chin size 1-nose</td>
<td>Therapist places size 1 dab of lotion on child’s forehead, left cheek, right cheek chin, and nose while describing application (example: saying, “Lotion on your on forehead, cheek, other cheek, chin and nose” then “Rub it all in”) child/therapist rubs it in and child leaves it on</td>
</tr>
<tr>
<td>Step 7</td>
<td>size 2-forehead size 2-left cheek size 2-right cheek size 1-chin size 1-nose</td>
<td>Therapist places size 2 dab of lotion on child’s forehead, size 1 on left cheek, size 1 on right cheek, size 1 on chin, and size 1 on nose while describing application (example: saying, “Dab of lotion on your on forehead, cheek, other cheek, chin and nose” then “Rub it all in”) child/therapist rubs it in and child leaves it on</td>
</tr>
<tr>
<td>Step 8</td>
<td>size 2-forehead size 2-left cheek size 2-right cheek size 1-chin size 1-nose</td>
<td>Therapist places size 2 dab of lotion on child’s forehead, size 2 on left cheek, size 1 on right cheek, size 1 on chin, and size 1 on nose while describing application (example: saying, “Dab of lotion on your on forehead, cheek, other cheek, chin and nose” then “Rub it all in”) child/therapist rubs it in and child leaves it on</td>
</tr>
<tr>
<td>Step 9</td>
<td>size 2-forehead size 2-left cheek size 2-right cheek size 1-chin size 1-nose</td>
<td>Therapist places size 2 dab of lotion on child’s forehead, size 2 on left cheek, size 2 on right cheek, size 1 on chin, and size 1 on nose while describing application (example: saying, “Dab of lotion on your on forehead, cheek, other cheek, chin and nose” then “Rub it all in”) child/therapist rubs it in and child leaves it on</td>
</tr>
<tr>
<td>Step 10</td>
<td>size 2-forehead size 2-left cheek size 2-right cheek size 2-chin size 1-nose</td>
<td>Therapist places size 2 dab of lotion on child’s forehead, size 2 on left cheek, size 2 on right cheek, size 2 on chin, and size 2 on nose while describing application (example: saying, “Dab of lotion on your on forehead, cheek, other cheek, chin and nose” then “Rub it all in”) child/therapist rubs it in and child leaves it on</td>
</tr>
<tr>
<td>Step 11</td>
<td>size 2-forehead size 2-left cheek size 2-right cheek size 2-chin size 2-nose</td>
<td>Therapist places size 2 dab of lotion on child’s forehead, size 2 on left cheek, size 2 on right cheek, size 2 on chin, and size 2 on nose while describing application (example: saying, “Dab of lotion on your on forehead, cheek, other cheek, chin and nose” then “Rub it all in”) child/therapist rubs it in and child leaves it on</td>
</tr>
<tr>
<td>Step 12</td>
<td>Size 2 ½ in palm of hand distributed throughout face</td>
<td>STEP ADDED TO HIERARCHY Therapist places size 2 ½ dab of lotion in therapist or child’s palm and is distributed throughout the face by either child or therapist while therapist describes application (example: saying, “Put some on your on forehead, cheek, other cheek, chin and nose” then “Rub it all in”) child/therapist rubs it in and child leaves it on</td>
</tr>
<tr>
<td>Step 13</td>
<td>Size 3 in palm of hand distributed throughout face</td>
<td>Therapist places size 3 dab of lotion in therapist or child’s palm and is distributed throughout the face by either child or therapist while therapist describes application (example: “Lotion on forehead, cheek, other cheek, chin and nose” then “Rub it all in” or similar statement) and child/therapist rubs it in and child leaves it on</td>
</tr>
<tr>
<td>Step 14</td>
<td>Size 4 in palm of hand distributed throughout face</td>
<td>Therapist places size 4 dab of lotion in therapist or child’s palm and is distributed throughout the face by either child or therapist while therapist describes application (example: “Dab on your forehead, cheek, other cheek, chin and nose” then “Rub it all in” or similar and child/therapist rubs it in and child leaves it on</td>
</tr>
<tr>
<td>Step 15</td>
<td>Size 5 in palm of hand distributed throughout face</td>
<td>Therapist places size 5 dab of lotion in therapist or child’s palm and is distributed throughout the face by either child or therapist while therapist describes application (example: saying, “Put some on your on forehead, cheek, other cheek, chin and nose” then “Rub it all in”) child/therapist rubs it in and child leaves it on</td>
</tr>
</tbody>
</table>
## HIERARCHY OF STEPS FOR SUNSCREEN

<table>
<thead>
<tr>
<th>Step</th>
<th>Size (portion) &amp; Location</th>
<th>Triad Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>size 1 - forehead</td>
<td>Therapist places size 1 dab of sunscreen on child’s forehead while describing application (example: “Sunscreen on forehead” then “Rub it all in”) and child/therapist rubs in lotion and child leaves it on</td>
</tr>
<tr>
<td>Step 2</td>
<td>size 1-forehead size 1-cheek</td>
<td>Therapist places size 1 dab of sunscreen on child’s forehead and left cheek while describing application (example: “Sunscreen on forehead and dab on cheek” then “Rub it all in”) and child/therapist rubs it in and child leaves it on</td>
</tr>
<tr>
<td>Step 3</td>
<td>size 1-forehead size 1-left cheek size 1-right cheek</td>
<td>Therapist places size 1 dab of sunscreen on child’s forehead, left cheek, and on right cheek while describing application (example: “Sunscreen on forehead, cheek, other cheek” then “Rub it all in”) and child/therapist rubs it in and child leaves it on</td>
</tr>
<tr>
<td>Step 4</td>
<td>size 1-forehead size 1-left cheek size 1-right cheek size 1-chin</td>
<td>Therapist places size 1 dab of sunscreen on child’s forehead, left cheek, right cheek, and chin while describing application (example: “Dab of Sunscreen on forehead, cheek, other cheek and chin” then “Rub it all in”) and child/therapist rubs it in and child leaves it on</td>
</tr>
<tr>
<td>Step 5</td>
<td>size 1/2-forehead size 1/2-left cheek size 1/2-right cheek size 1/2-chin</td>
<td>Therapist places size 1/2 dab of sunscreen on child’s forehead, left cheek, right cheek, chin, and nose while describing application (example: “Dab of Sunscreen on forehead, cheek, other cheek, chin, and nose” then “Rub it all in”) and child/therapist rubs it in and child leaves it on</td>
</tr>
<tr>
<td>Step 6</td>
<td>size 1-forehead size 1-left cheek size 1-right cheek size 1-chin size 1-nose</td>
<td>Therapist places size 1 dab of sunscreen on child’s forehead, left cheek, right cheek, chin and nose while describing application (example: “We’re going to put some on your on forehead, some on your cheek, other cheek, sunscreen on your chin and nose” then “Rub it all in”) and child/therapist rubs it in and child leaves it on</td>
</tr>
<tr>
<td>Step 7</td>
<td>size 2-forehead size 1-left cheek size 1-right cheek size 1-chin size 1-nose</td>
<td>Therapist places size 2 dab of sunscreen on child’s forehead, size 1 on left cheek, size 1 on right cheek, size 1 on chin, and size 1 on nose while describing application (example: “Sunscreen on forehead, cheek, other cheek, chin, and nose” then “Rub it all in”) and child/therapist rubs it in and child leaves it on</td>
</tr>
<tr>
<td>Step 8</td>
<td>size 2-forehead size 2-left cheek size 1-right cheek size 1-chin size 1-nose</td>
<td>Therapist places size 2 dab of sunscreen on child’s forehead, size 2 on left cheek, size 1 on right cheek, size 1 on chin, and size 1 on nose while describing application (example: “Dab some on forehead, cheek, other cheek, chin and nose” then “Rub it all in”) and child/therapist rubs it in and child leaves it on</td>
</tr>
<tr>
<td>Step 9</td>
<td>size 2-forehead size 2-left cheek size 2-right cheek size 1-chin size 1-nose</td>
<td>Therapist places size 2 dab of sunscreen on child’s forehead, size 2 on left cheek, size 2 on right cheek, size 1 on chin, and size 1 on nose while describing application (example: “Let’s put some on your forehead, cheek, other cheek, chin and nose” then “Rub it all in”) and child/therapist rubs it in and child leaves it on</td>
</tr>
<tr>
<td>Step 10</td>
<td>size 2-forehead size 2-left cheek size 2-right cheek size 2-chin size 1-nose</td>
<td>Therapist places size 2 dab of sunscreen on child’s forehead, size 2 on left cheek, size 2 on right cheek, size 2 on chin, and size 1 on nose while describing application (example: “Sunscreen on your forehead, cheek, other cheek, chin and nose” then “Rub it all in”) and child/therapist rubs it in and child leaves it on</td>
</tr>
<tr>
<td>Step 11</td>
<td>size 2-forehead size 2-left cheek size 2-right cheek size 2-chin size 2-nose</td>
<td>Therapist places size 2 dab of sunscreen on child’s forehead, size 2 on left cheek, size 2 on right cheek, size 2 on chin, and size 2 on nose while describing application (example: “Dab on forehead, dab of sunscreen on your cheek, other cheek, chin and nose” then “Rub it all in”) and child/therapist rubs it in and child leaves it on</td>
</tr>
<tr>
<td>Step 12</td>
<td>Size 1/2 in palm of hand distributed throughout face</td>
<td>Therapist places size 1/2 in palm of sunscreen in therapist or child’s palm and is distributed throughout the face by either child or therapist while therapist describes application (example: “Sunscreen on forehead, cheek, other cheek, chin and nose” then “Rub it all in”) and child/therapist rubs it in and child leaves it on</td>
</tr>
<tr>
<td>Step 13</td>
<td>Size 3 in palm of hand distributed throughout face</td>
<td>Therapist places size 3 dab of sunscreen in therapist or child’s palm and is distributed throughout the face by either child or therapist while therapist describes application (example: “Sunscreen on forehead, cheek, other cheek, chin and nose” then “Rub it all in”) and child/therapist rubs it in and child leaves it on</td>
</tr>
<tr>
<td>Step</td>
<td>Size (portion) &amp; location</td>
<td>Description</td>
</tr>
<tr>
<td>------</td>
<td>----------------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Step 1</td>
<td>size 1- forehead</td>
<td>Therapist places size 1 dab of face wash on child’s forehead while describing application and removal (example: “Face wash on forehead” then “Rub a little” then “Splash it off”) and child/therapist rubs the face wash then washes it off completely and dries his face.</td>
</tr>
<tr>
<td>Step 2</td>
<td>size 1- forehead, size 1- cheek</td>
<td>Therapist places size 1 dab of face wash on child’s forehead and left cheek while describing application and removal (example: “Face wash on forehead and dab on cheek” then “Rub a little” then “Splash it off”) and child/therapist rubs the face wash then washes it off completely and dries his face.</td>
</tr>
<tr>
<td>Step 3</td>
<td>size 1- forehead, size 1- left cheek, size 1- right cheek</td>
<td>Therapist places size 1 dab of face wash on child’s forehead, left cheek, and right cheek while describing application and removal (example: “Dab/Face wash on forehead, cheek, other cheek” then “Rub a little” then “Wash/Splash it off”) and child/therapist rubs the face wash then washes it off completely and dries his face.</td>
</tr>
<tr>
<td>Step 4</td>
<td>size 1- forehead, size 1- left cheek, size 1- right cheek, size 1- chin</td>
<td>Therapist places size 1 dab of face wash on child’s forehead, left cheek, right cheek, and chin while describing application and removal (example: “Dab/Face wash on forehead, cheek, other cheek and chin” then “Rub a little” then “Splash it off”) and child/therapist rubs the face wash then washes it off completely and dries his face.</td>
</tr>
<tr>
<td>Step 5</td>
<td>size ½- forehead, size ½- left cheek, size ½- right cheek, size ½- chin, size ½- nose</td>
<td>Therapist places size ½ dab of face wash on child’s forehead, cheek, right cheek, chin, and nose while describing application and removal (example: “Face wash on forehead, cheek, other cheek, chin, and nose” then “Rub a little” then “ Splash it off”) and child/therapist rubs the face wash then washes it off completely and dries his face.</td>
</tr>
<tr>
<td>Step 6</td>
<td>size 1- forehead, size 1- left cheek, size 1- right cheek, size 1- chin, size 1- nose</td>
<td>Therapist places size 1 dab of face wash on child’s forehead, left cheek, right cheek, chin, and nose while describing application and removal (example: “Face wash on forehead, cheek, other cheek, chin and nose” then “Rub a little” then “ Splash it off”) and child/therapist rubs the face wash then washes it off completely and dries his face.</td>
</tr>
<tr>
<td>Step 7</td>
<td>size 2- forehead, size 1- left cheek, size 1- right cheek, size 1- chin, size 1- nose</td>
<td>Therapist places size 2 dab of face wash on child’s forehead, size 1 on left cheek, size 1 on right cheek, size 1 on chin, and size 1 on nose while describing application and removal (example: “Face wash on forehead, cheek, other cheek, chin and nose” then “Rub a little” then “Splash it off”) and child/therapist rubs the face wash then washes it off completely and dries his face.</td>
</tr>
<tr>
<td>Step 8</td>
<td>size 2- forehead, size 2- left cheek, size 2- right cheek, size 1- chin, size 1- nose</td>
<td>Therapist places size 2 dab of face wash on child’s forehead, size 2 on left cheek, size 1 on right cheek, size 1 on chin, and size 1 on nose while describing application and removal (example: “Face wash on forehead, cheek, other cheek, chin and nose” then “Rub a little” then “Splash it off”) and child/therapist rubs the face wash then washes it off completely and dries his face.</td>
</tr>
<tr>
<td>Step 9</td>
<td>size 2- forehead, size 2- left cheek, size 2- right cheek, size 1- chin, size 1- nose</td>
<td>Therapist places size 2 dab of face wash on child’s forehead, size 2 on left cheek, size 2 on right cheek, size 1 on chin, and size 1 on nose while describing application and removal (example: “Dab on forehead, cheek, other cheek, chin and nose” then “Rub a little” then “ Splash it off”) and child/therapist rubs the face wash then washes it off completely and dries his face.</td>
</tr>
<tr>
<td>Step 10</td>
<td>size 2- forehead, size 2- left cheek, size 2- right cheek, size 2- chin, size 1- nose</td>
<td>Therapist places size 2 dab of face wash on child’s forehead, size 2 on left cheek, size 2 on right cheek, size 2 on chin, and size 1 on nose while describing application and removal (example: “Dab on forehead, cheek, other cheek, chin and nose” then “Rub a little” then “ Splash it off”) and child/therapist rubs the face wash then washes it off completely and dries his face.</td>
</tr>
<tr>
<td>Step 11</td>
<td>size 2- forehead, size 2- left cheek, size 2- right cheek, size 2- chin, size 2- nose</td>
<td>Therapist places size 2 dab of face wash on child’s forehead, size 2 on left cheek, size 2 on right cheek, size 2 on chin, and size 2 on nose while describing application and removal (example: “Dab on forehead, cheek, other cheek, chin and nose” then “Rub a little” then “ Splash it off”) and child/therapist rubs the face wash then washes it off completely and dries his face.</td>
</tr>
<tr>
<td>Step 12</td>
<td>size 2 ½ in palm of hand distributed throughout face</td>
<td>Therapist places size 2 ½ dab of face wash in therapist or child’s palm and is distributed throughout the face by either child or therapist while therapist describes application and removal (example: “Face wash on forehead, cheek, other cheek, chin and nose” then “Rub a little” then “Splash it off”) and child/therapist rubs the face wash then washes it off completely and dries his face.</td>
</tr>
<tr>
<td>Step 13</td>
<td>size 3 in palm of hand distributed throughout face</td>
<td>Therapist places size 3 dab of face wash in therapist or child’s palm and is distributed throughout the face by either child or therapist while therapist describes application and removal (example: “Face wash on forehead, cheek, other cheek, chin and nose” then “Rub a little” then “ Splash it off”) and child/therapist rubs the face wash then washes it off completely and dries his face.</td>
</tr>
<tr>
<td>Step 14</td>
<td>size 4 in palm of hand distributed throughout face</td>
<td>Therapist places size 4 dab of face wash in therapist or child’s palm and is distributed throughout the face by either child or therapist while therapist describes application and removal (example: “Face wash on forehead, cheek, other cheek, chin and nose” then “Rub a little” then “ Splash it off”) and child/therapist rubs the face wash then washes it off completely and dries his face.</td>
</tr>
<tr>
<td>Step 15</td>
<td>size 5 in palm of hand distributed throughout face</td>
<td>Therapist places size 5 dab of face wash in therapist or child’s palm and is distributed throughout the face by either child or therapist while therapist describes application and removal (example: “Let’s put some face wash on forehead, cheek, other cheek, chin and nose” then “Rub a little” then “ Splash it off”) and child/therapist rubs the face wash then washes it off completely and dries his face.</td>
</tr>
<tr>
<td>Step 16</td>
<td>size 6 in palm of hand distributed throughout face</td>
<td>Therapist places size 6 dab of face wash in therapist or child’s palm and is distributed throughout the face by either child or therapist while therapist describes application and removal (example: “Face wash on forehead, cheek, other cheek, chin and nose” then “Rub a little” then “ Splash it off”) and child/therapist rubs the face wash then washes it off completely and dries his face.</td>
</tr>
</tbody>
</table>
APPENDIX D

SAMPLE TRAINING SESSION
1. Experimenter arrives at participant home and greets both parent and participant
   a. Participant is given access to break (preferred activities)
   b. Experimenter talks to parent and briefly describes session plans
2. Experimenter arranges setting
   a. Video camera is set up
   b. Target product placed next to sink
3. Experimenter engages in preferred activities with the child while on break
4. Experimenter tells child, “It’s time for lotions” or similar. Video camera turned on.
   a. Both child and experimenter enter the bathroom
   b. Experimenter presents product to the child and says, “We’re going to put on some sunscreen” or similar statement
   c. Trial begins: Experimenter places size 3 sunscreen in child’s palm and then on each part of child’s face while saying, “Lotion on your forehead, lotion on your cheek, lotion on your other cheek, lotion on your chin. And we’re gunna rub it all in”
   d. Experimenter demonstrates rubbing on her own face while smiling and laughing
   e. Student began to wash hands then used the towel to dry his hands and wipe the lotion off his face (negative physical response)
5. Trial ends, new trial presented
   a. Experimenter places size 1 on each part of child’s face while saying, “We’re going to put some lotion on your forehead, lotion on your cheek, lotion on your other cheek, lotion on your chin. And we’re gunna rub it all in”
   b. Experimenter demonstrates rubbing lotion on her own face while smiling and laughing saying, “Rub it all in”
   c. Child imitates model effectively
   d. Experimenter says, “You did it” and gives high fives and vocal praise
      Experimenter gives letter for correct responding
6. Trial ends, new trial presented
   a. Experimenter places size 1 on each part of child’s face while saying, “Lotion on your forehead, lotion on your cheek, lotion on your other cheek, lotion on your chin. And we’re gunna rub it all in”
   b. Experimenter demonstrates rubbing on her own face while smiling and laughing saying, “Rub it all in”
   c. Child imitates model effectively
   d. Experimenter says, “You did it” and gives high fives and vocal praise
      Experimenter gives letter for correct responding spelling out word “BREAK”
7. Experimenter and child leave bathroom and take break together and engage in child’s preferred activities. Video camera turned off
8. Return from break to bathroom. Video camera turned on.
a. Experimenter places size 2 on each part of child’s face while saying, “We’re going to put some lotion on your forehead, lotion on your cheek, lotion on your other cheek, lotion on your chin. And we’re gunna rub it all in”
b. Child begins to rub lotion on his face.
c. “Experimenter says, “Look in the mirror, you have to make it all disappear”
d. Provides vocal praise for correct attempts.
e. Child still has some lotion on his face and experimenter models rubbing on her own face while smiling and laughing
f. Child imitates model smiling but does not effectively wipe in all of the lotion
g. Experimenter says, “I’m going to help you a little” and helps the child rub in the lotion on his face
h. Experimenter says, “Yeah, you did a great job. It’s all gone!” and gives a letter A for correct responding
i. Experimenter places size 2 on each part of child’s face while saying, “We’re going to put some lotion on your forehead, lotion on your cheek, lotion on your other cheek, lotion on your chin. And we’re gunna rub it all in”
j. Child begins to rub lotion on his face then stops.
k. Experimenter models rubbing it in and says, “Like this, rub it all in”
l. Child imitates model effectively.
m. Experimenter says, “Yeah, you did a great job. It’s all gone!” and gives a letter K for correct responding
9. Experimenter and child leave bathroom and take break together and engage in child’s preferred activities. Video camera turned off
10. Experimenter packs up materials and camera
11. Goes to talk to parent and discuss session progress
12. Says goodbye to both parent and child.
APPENDIX C

INTEROBSERVER AGREEMENT & TREATMENT INTEGRITY TABLES
### Interobserver Agreement Table

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th>Face Lotion Treatment</th>
<th>Face Lotion Gen. Training</th>
<th>Sunscreen Treatment</th>
<th>Sunscreen Gen. Training</th>
<th>Facewash Treatment</th>
<th>Facewash Gen. Training</th>
<th>Face Lotion Follow up probes</th>
<th>Sunscreen Follow up probes</th>
<th>Facewash follow up probes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neg. Responses</td>
<td>90%</td>
<td>93%</td>
<td>100%</td>
<td>100%</td>
<td>67%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>80%</td>
<td>100%</td>
</tr>
<tr>
<td>Pos. Responses</td>
<td>96%</td>
<td>71%</td>
<td>25%</td>
<td>67%</td>
<td>67%</td>
<td>100%</td>
<td>60%</td>
<td>100%</td>
<td>80%</td>
<td>75%</td>
</tr>
</tbody>
</table>

### Treatment Integrity Table

<table>
<thead>
<tr>
<th>Face Lotion Treatment</th>
<th>Face Lotion Gen. Training</th>
<th>Sunscreen Treatment</th>
<th>Sunscreen Gen. Training</th>
<th>Facewash Treatment</th>
<th>Facewash Gen. Training</th>
<th>Face Lotion Follow up probes</th>
<th>Sunscreen Follow up probes</th>
<th>Facewash follow up probes</th>
</tr>
</thead>
<tbody>
<tr>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>83%</td>
<td>100%</td>
<td>100%</td>
<td>94%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>
APPENDIX F

SOCIAL VALIDITY QUESTIONNAIRE
Skin Care Product Intervention

<table>
<thead>
<tr>
<th>Important</th>
<th>Not important</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. How important was the goal of this treatment?</td>
<td>1  2  3  4  5</td>
</tr>
<tr>
<td>2. How important was the method of this treatment?</td>
<td>1  2  3  4  5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Very satisfied</th>
<th>Not satisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. How satisfied are you with the method?</td>
<td>1  2  3  4  5</td>
</tr>
<tr>
<td>4. How satisfied are you with the outcome?</td>
<td>1  2  3  4  5</td>
</tr>
</tbody>
</table>

Please write your responses to the questions below, in your own words. Feel free to use the back or another piece of paper for your responses.

5. What has it meant for your child to have participated in this study?

6. What has it meant for you and your family to have your child participate in this study?

7. Please make suggestions on ways in which to improve these procedures
REFERENCE LIST


