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The Effect of Display Rules on Illusion of Transparency in Children

The illusion of transparency, the tendency for people to overestimate how obvious their internal states appear to outside observers, was examined in 25 school-age children. While previous researchers studied undergraduate participants, we aimed to expand the developmental literature by investigating whether children exhibit the illusion of transparency in the same manner as undergraduates. We presented each child with three pleasant-tasting drinks and two unpleasant-tasting drinks. Two undergraduate observers and the children rated facial expressions after each sip. Our results supported our hypothesis with no illusion of transparency for the unpleasant drinks; however, an illusion was found for the pleasant drinks. The children's inability to follow display rules may explain the absence of the illusion of transparency for the unpleasant condition.

When that hand-knit sweater from Grandma Eleanor first makes its debut or a dry fruitcake hand-baked by well-meaning Petunia appears at your doorstep, one cannot help but assume that dissatisfaction was painfully obvious despite the forced gratitude exhibited. This common sensation is known as the illusion of transparency. This illusion, a tendency for people to overestimate the degree to which their personal mental state is clear to others, is more prevalent in society than expected (Miller & McFarland, 1987). Display rules, a social group's informal norms about when, where, and how one should express emotions (Ekman, Friesen, & Ellsworth, 1972), play a significant role in the development, presence, and intensity of the illusion of transparency.

A person's perception of the strength of their revealed emotions has been found to differ significantly from observers' impressions of their facial expressions. People on average will be less expressive than they feel they appeared. In experiment two of their study, participants were shown a video recording of themselves taken earlier (Barr & Kleck, 1995). Interestingly, 50% of the participants were rated by judges as displaying less emotion than the participant's self-ratings indicated, whereas only 13% were rated as being more expressive than their self-ratings. These findings support the presence of an illusion of transparency in half of their participants.

More recently, Gilovich, Savitsky, & Medvec

(1998) studied the illusion of transparency by having twenty-five undergraduate participants sip fifteen drinks, five that tasted unpleasant and ten that tasted pleasant. Regardless of taste, participants were asked to maintain a neutral facial expression. After each drink, the participant immediately recorded how many observers they believed would correctly identify the taste of the drink. Videotapes of the participants were shown to ten observers whose roles were to identify which drinks were unpleasant based upon the tasters' facial expressions. Tasters estimated an average of 4.91 observers would correctly identify the unpleasant drinks based upon their facial expressions, but only 3.56 observers actually made the correct identifications. These results suggest that the participants believed their disgust for the unpleasant drinks showed through their facial expressions more than the observers actually noticed, implying that the participants exhibited an illusion of transparency. In addition, Gilovich et al. (1998) found that the illusion of transparency appears to be dependent upon an emotional arousal occurring in a person. For example, participants displayed the illusion of transparency in the lying condition and when tasting the unpleasant drinks, but did not display the illusion when being truthful or when sipping the pleasant tasting drinks.

Holder & Hawkins (2007) studied sex differences in the illusion, hypothesizing that women are more susceptible to the illusion of transparency. The study used a similar method to the Gilovich et al. (1998) study and demonstrated results supporting the presence of an illusion. Contrary to the hypothesis, they found no significant difference in the illusion of transparency between men and women.

Other researchers have looked at whether the amount of anxiety induced by a social situation will affect the illusion of transparency in participants. Brown and Stopa (2007), for example, found that the level of the illusion of transparency did not change from a low social-evaluative condition (where the task was viewed by a coder looking for a number of 'significant events') to a high social-evaluative condition (where the task was evaluated by experts). Therefore, these researchers suggest

that the illusion of transparency is not a transitory state that changes with circumstances, but rather is consistent and stable with qualities similar to a personality trait.

In the present study we aimed to extend the previous research by testing the illusion of transparency in children. The empirical focus thus far has been on undergraduate participants; therefore, developmental literature can benefit from investigating whether children exhibit the illusion of transparency in the same manner as adults. A key factor that may create a difference in this illusion for children is display rules. Several studies have examined display rules in different age groups. In a study conducted by Misailidi (2006), children ages 4 to 6 were read a story and asked what facial expression the main character would exhibit in the given situation. The experimenters were interested in the children's knowledge of real versus apparent emotions. The data revealed an increase in understanding as children grew older. Another study found that third graders seemed to be at a transitioning point in their development of display rules. Based on the results, the researcher concluded that as age increases, children realize that internal emotion and external expression do not need to correspond with one another. Findings also suggest that, although they may understand this concept, young children cannot perform or articulate these conflicting representations as well as older children (Saarni, 1984).

Another study supported these findings, suggesting that there is a steady development in children's understanding and performance of display rules in children as they grow older, reporting a specific increase from 1st to 5th grade. In addition, this study found that children are better able to follow verbal display rules than facial display rules. This is credited to adult encouragement and instructions, prompting children to make statements like, "don't forget to thank Grandma" or "don't say things like that". It is less common for adults to give feedback to children about controlling their facial expressions (Gnepp & Hess, 1986). In our study we looked at facial display rules in children from kindergarten through 2nd grade. Research suggests that this type of display rule would be difficult for

children this age, which could greatly influence the presence of an illusion of transparency in children.

The age in which a child can create the facial movements involved in certain emotions is critical when assessing their ability to display those same emotions according to a certain societal rule. One study looked at the extent to which children, ages 5 to 13, can form elemental and complex facial expressions. The researchers found that most of the children in the youngest age group (mean age, 5-8) could perform the elemental expressions, but had difficulty performing more complex expressions. For example, the youngest children could raise their eye brows, one of the elemental facial movements, but they were unable to raise their upper eyelid or drop their jaw, two elements needed to make a complex surprise expression. Researchers found improvement in producing both elemental and complex facial actions as age increased, with the largest improvements occurring between ages 5 and 9 (Ekman, Roper, & Hager, 1980). This is exactly the age group used in our study, suggesting the need for consideration in choosing a facial expression for our display rule that the children would be able to physically perform.

In our study, the children participants were told to keep a neutral face when tasting five drinks and observers rated them on their ability to follow this display rule. Based on the research, we hypothesized that children will not show an illusion of transparency due to an inability to follow display rules in extreme situations, such as tasting a "yucky" drink.

Method

Participants

Participants were twenty-five children (12 Male, 13 Female). All students were Caucasian, remaining consistent with the area from which the children came. We contacted the principal of a local private school. After explaining the planned procedure, he agreed to oversee our research. We sent informed consent documents, and 25 parents gave their consent for their children's participation. Only children whose parents provided informed consent participated, and each child provided assent before

participating. This study was approved by the Grove City College IRB. The final sample included children in grades kindergarten through third grade with 5 kindergarteners, 8 first graders, 5 second graders, and 7 third graders ($M = 6.76$ years old, $SD = 1.13$).

Materials

The materials used in this study included disposable cups, a pitcher of Sweetened Kool-aid, a pitcher of Sugar-free Kool-aid mixed with baking soda, and stickers. We also created a five-point scale to rate the child's facial expressions (1 – Very Yucky Face, 2 – Little Yucky Face, 3 – No Face, 4 – Little Yummy Face, 5 – Very Yummy Face). Three copies of the five-point scale were included for each child; one for the child to use for rating the child's facial expression and one for each of the two the observers to use for rating the child's facial expression (see Appendix for scale).

Procedure

Participants were greeted by an experimenter and led into a room. The room contained four people in addition to the participant and experimenter – two observers, a recorder, and the principal of the private school. After taking a seat, the instructions were read aloud (see Appendix for instructions).

The children were asked to play a game in which they were instructed to hide which drinks were pleasant and unpleasant from the observers by keeping a neutral face. The children sat at a table with five identical looking drinks. Three of the beverages had a pleasant taste made with Sweetened Kool-aid, and two of the beverages had an unpleasant taste made with Sugar-free Kool-aid and baking soda. The children took a sip of each drink after we read the instructions to them. The drinks were arranged in a random order for each child with a pleasant drink always in the first position. The children and two undergraduate observers rated their facial expression after each sip on the five-point scale. The two observers showed inter-rater reliability for the unpleasant drinks with significant correlations of $r(24) = .906$ and $r(24) = .468$, and for the pleasant drinks showing the significant correlations of $r(24) = .745$, $r(24) = .601$, and $r(24) = .403$ respectively. At the completion of the experiment, participants were given a sticker of

their choice.

Results

The children and the observers made similar ratings for the child's expression in the unpleasant drink situations. According to a paired samples t-test analyzing the children and the combined observers' rating of facial expressions for the unpleasant drink, the children's ratings were not significantly different from the observer's ratings, $t(24) = .148$, $p = .884$ ($M = .03$, $SD = .6767$). This indicates that there was no illusion of transparency for the unpleasant drinks. For the pleasant drinks, the children and the observers rated the child's expression differently. A t-test comparing children and observer ratings showed that the children rated their facial expression between no face and little "yummy" face, while the observers rated the facial expression as no face, $t(24) = 3.462$, $p = .002$. The respective means (with standard deviations) for children and observers were ($M = 3.44$, $SD = .61403$) and ($M = 3.01$, $SD = .45623$). Therefore, an illusion of transparency for the pleasant drinks is indicated. Figure 1 shows the difference in the mean child ratings of facial expressions and the mean observer rating of facial expressions for both the unpleasant drink condition and the pleasant drink condition. The difference between the means for the unpleasant drink is much smaller than the difference between the means for the pleasant drink. The difference between the means of the pleasant drinks shows that an illusion of transparency was present in this condition. No effect was observed for gender. An independent samples t-test showed no significant differences in ratings between male and female children for the unpleasant drinks, $t(23) = -1.122$, $p = .273$, and the pleasant drinks, $t(23) = 1.606$, $p = .122$.

Discussion

Our results support the hypothesis that children will show no illusion of transparency in the extreme situation of tasting an unpleasant drink. Previous literature suggests our participants would exhibit an illusion of transparency in the unpleasant drink condition (Gilovich, Savitsky, & Medvec, 1998);

however, the age of the participants offers a possible explanation for difference. The majority of past research in this area includes young adult participants, so using child participants involves different third variables such as difficulty with display rules implementation.

Research by Saarni suggests that children younger than the fifth-grade level will struggle to follow the display rule set in place (Saarni, 1984). In the present study, we implemented the display rule to maintain a neutral face throughout both drink conditions. The selection of a facial expression task also contributes to children's display rule difficulties. In our study, we elicited facial expressions rather than verbal expressions from our participants. Children experience more difficulty when following display rules that involve facial expressions because they have less physical development in their fine movements within facial muscles. Verbal expressions are easier for children to control, since parents tend to censor rude comments but overlook their children's inappropriate facial responses. When sipping drinks that taste unpleasant, children naturally contort their faces into disgusted expressions. Therefore, the task to hide negative facial expressions after drinking an unpleasant drink is not one that children are accustomed to performing (Gnepp & Hess, 1986; Ekman, Roper, & Hager, 1980).

However, in the pleasant drink condition, children demonstrated an illusion of transparency. When children tasted pleasant drinks, they demonstrated more control over their facial expressions compared to when they tasted unpleasant drinks. The findings suggest that once children can control facial expressions enough to follow display rules, the illusion of transparency is present. As previous literature indicates, there are no significant differences between male and female child participants for either drink conditions (Holder & Hawkins, 2007).

Several implications can be made from our study. In an extreme situation, such as the unpleasant drink situation, young children have difficulty expressing one emotion if they are experiencing a different one at the same time. Even when participants comprehend the display rule, they continue to

display an emotion on their faces rather than maintaining a neutral face as the display rule requires. When shifting to less extreme conditions, as in the pleasant drink condition, children behave more like adults. Children believe their own facial expressions appear more expressive than observers actually measure, because the children sense their internal experiences as appearing more obvious to outsiders in the same way that adults do.

There are a few limitations regarding our ability to generalize our findings to a larger population of children. Due to time and geographic restraints, we selected the children first available to participate in our study. All participants attend a small Christian school and reside within the same rural region. Behavior found amongst our child participants may not generalize to children in more densely populated regions, to children in publicly educated institutions, or to children of varying racial or ethnic backgrounds. Although homogeneity amongst our participants limits the external validity of the findings, we doubt any specific characteristics that may distinguish our participants from the general population of children would influence the results. Any children ranging between kindergarten and third grade should reflect similar difficulties with display rules in extreme conditions and exhibit tendencies of illusion of transparency in less extreme conditions. We expect results from children in different geographic locations and from various racial or ethnic backgrounds to be analogous to our study.

When administering the study, we presented the experiment as a game to the participants. The children could have taken it less seriously due to the informal presentation; however this is a commonly used procedure in developmental studies. The children maintained a neutral face fairly well according to the observers' ratings. Using the five-point scale, the undergraduate observers rated the children's facial expressions on average as 3.01 and 2.32 in the pleasant and unpleasant conditions, respectively. These results suggest that the children took the task seriously.

Future research should continue to explore the illusion of transparency in children because the majority of literature on this phenomenon involves adult participants. Replacing adults with children

results in a host of different findings and multiple explanations as to why the participant age alters the findings so dramatically (Holder & Hawkins, 2007; Brown & Stopa, 2006; Gilovich, Savitsky, & Medvec, 1998; Barr & Kleck, 1995). Research should target older children, specifically into fifth grade or beyond. Saarni concludes that children improve in their ability to follow display rules between first and fifth grades (Saarni, 1984), so studying older children could eliminate display rules as a third variable. Moreover, future studies should increase the sample size for each grade level in order to compare the findings between children in different grades. Another way to reduce the effects of display rules is to avoid observing facial expressions. Children struggle to mask emotion in their faces (Gnepp & Hess, 1986), so observers could measure verbal or behavioral expressions, which children are more able to control.

Additionally, researchers should train the observers more extensively for future studies. We instruct the observers to rate the child's initial facial expression after each drink, but the instructions include no indication as to the overall aim of the study. As a result, the observers are left to form their own inferences as to the study's purpose and adjust their own behavior according to the purpose they presume it to be. In this instance, our observers tend to rate the children's facial expressions stringently, judging a facial expression to reveal emotion more hastily than the typical observer might. This tendency may suggest that observers presume the study is exploring display rules. If the study were measuring display rules, then stringent ratings would support the hypothesis; however, the stringent ratings negatively affect our findings when measuring the illusion of transparency.

Despite its limitations, our research illustrates important implications regarding the illusion of transparency and display rules among children. The present study serves as a stepping stone to proliferate the body of research on this phenomenon. Through more research we could gain a more extensive knowledge on the illusion of transparency in children and adults alike.

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Figure 1. Difference in Child and Observer Ratings in Unpleasant Versus Pleasant Drink Conditions.

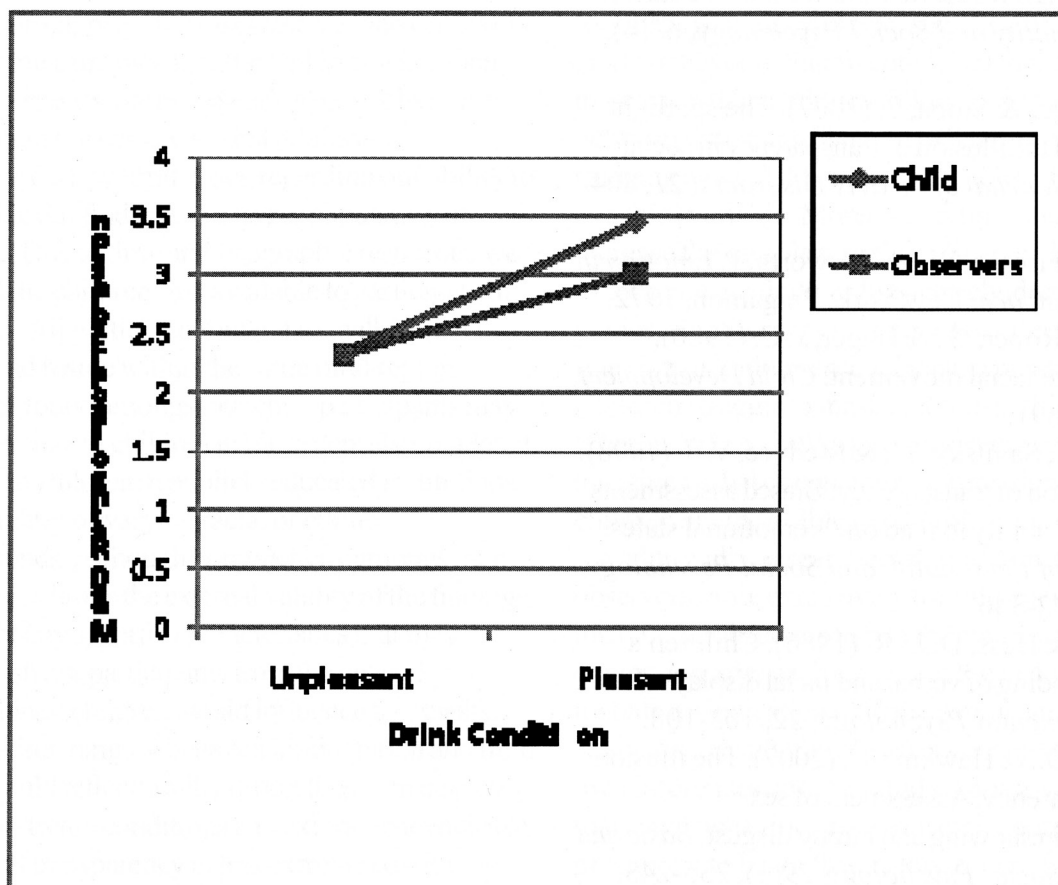
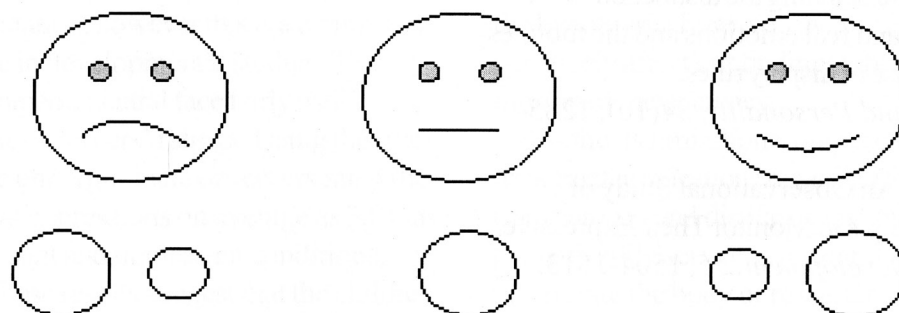


Figure 2. Scale to Rate the Child's Facial Expressions



Appendix

Instructions:

"Thank you for helping us with our homework! When you are done in here, we will give you a sticker for your help. Now we're going to play a game. In front of you are five drinks. You are going to be taking a small sip of each of the drinks when we tell you to. Two of those drinks will taste yucky and three of them will taste yummy. We want you to try to trick our friends (point to observers), so that they won't know which drinks taste yummy or yucky. Do you want to play this game with us?"

Good. We'll need you to put on this poncho so that you're clothes don't get any spills on them. (Put poncho on participant) Now let me explain how you play the game. Your job is to try to make "no face" when you taste the drink. So if the drink tastes good, don't make a face like this (show a yummy face) and if the drink tastes bad, don't make a face like this (yucky face). Make no face at all (show no face). If the drink is too yucky for you, just spit it back into the cup. Don't worry though, what you are drinking just has a little bad taste. It is safe to drink and it will not make you feel sick. After you take a sip of the drink, I'll have you point to a picture that you think looked most like your face (show them the scale briefly). Now let's make sure you understand. Can you show me what kind of face that you are going to try to make when you taste the drink?" Respond with either of the following:

- "Yes, that's right. We want you to make 'no face' so the observers do not know what your drink tastes like."
- "Not quite, we want you to try to make 'no face' at all. Like this. (Show them a neutral face.) Can you do that for me? Great!"

Instructions after sipping each drink:

"Now we need you to tell us what face you think those observers just saw you make. Did you make a 'yucky face', 'no face', or a 'yummy face'? Was it a little 'yucky/yummy' or really 'yucky/yummy'? Please point to the facial expression on the rating sheet." Instead of praising the child, say any of the following:

- "Ok."
- "Thank you."
- "This one?"