

# Children's Selection of Posterior Restorative Materials

Ross Fishman\*/Marcio Guelmann\*\*/ Enrique Bimstein\*\*\*

*This study evaluated children's preference for posterior restorations. After viewing photographs of amalgam, composite, colored compomer and stainless steel crowns, 100 children 5-12 years-old responded to a satisfaction survey. The influence of age, gender and ethnicity was assessed and statistically analyzed. Composite resins were preferred the most and amalgam the least. Caucasians mostly selected composites while African Americans stainless steel crowns. Early interest in colored compomers was seen in young, males and Caucasians.*

J Clin Pediatr Dent 31(1):1-4, 2006

## INTRODUCTION

Presently, patients have a greater awareness of oral health and are much more conscious about esthetics and its social impact.<sup>1</sup> To keep up with this demand, esthetic restorative materials and techniques are constantly being developed.

In the 1980's, orthodontists began offering their patients, especially children, custom colorful orthodontic appliances and ligature ties.<sup>2</sup> It was one of the first times dentistry attempted to market to a child's desires. Subsequently, orthodontists saw an increase in patient acceptance and compliance.<sup>3</sup> Looking to capitalize on this success, two companies recently introduced a colored compomer for the restoration of primary teeth (Twinky Star, Voco, Germany and Magicfil™, Zenith/DMG, Englewood, N.J.). Although no formal study has been conducted to compare patient acceptance of these new colored materials, favorable returns have been noted in children 7-11 years old.<sup>4</sup> This patient-driven trend appears to be a culmination of a transition in restorative materials that began many years ago. Adults have shown a preference for esthetically pleasing teeth,<sup>5,6</sup> but the research pertaining to children's desire for a particular restorative material has just begun.

Research has shown that dentists have decreased the use of amalgam<sup>7-12</sup> and increased the utilization of tooth colored materials such as glass ionomers and resin-based materials in both primary and permanent teeth.<sup>11-15</sup> Although the transition was initially thought to be related to improved mechanical properties and conservative tooth preparations of glass ionomers and resin-based materials,<sup>13,16</sup> one could not help but wonder if there was another motivating factor. As these trends continued, studies have looked into possible additional reasons for the change and found that esthetics was a major contributor, in both adults and children.<sup>15,12,15</sup> Therefore, researchers began

to survey dentists and adults about esthetics.<sup>6,17</sup> Several studies surveyed pediatric dentists for their preference for restorative material for children. These studies demonstrated a tendency toward selection of tooth colored materials.<sup>12,14</sup> At this point, only one study has investigated the preferences of the child for the restorative material.<sup>1</sup> In that study, parents and children were questioned in a private practice setting about their desires for certain restorative materials after reading a summary of the properties and indications of amalgam and resin-based materials. The results of this study and its nature are very important in today's consumer driven society where the influence of patient demands and esthetics are rising.<sup>18</sup>

The aim of the present study was to explore children's preferences by focusing on visual selection of different restorative materials for posterior restorations.

## MATERIALS AND METHODS

After parental consent, obtained by reading an explanatory Institutional Review Board approved research letter, children (5 years-old and older) in the waiting room area of the Pediatric Dental Clinic at the University of Florida were individually approached by the principal investigator. Away from possible parental influence, they were asked to answer a few questions. The preliminary ones related to demographics like age, gender, ethnicity, number of dental visits a year and if they had or not had a restorative filling placed in their teeth. After that, four laminated colored pictures of different types of posterior restorations (an amalgam, a tooth-colored restoration, a colored restoration, and a stainless steel crown) were shown to the child in a random order. The child was asked to point to the restoration they "liked the most" and the one they "liked the least". Lastly, they were asked to point to the restoration they would like to have in their mouth if a "filling" was necessary. Upon completion of the survey, data was logged and statistically analyzed (JMP, version 5, 1989-2002, SAS Institute Inc. Cary NC, USA) using Chi-square and Fisher's Exact Test.

## RESULTS

One hundred children were randomly interviewed and equally divided into two age groups, 5 to 8 (Group 1) and 9 to 12 (Group 2). The mean age for Group 1 was 6.98 years old and the mean age for Group 2 was 10.20 years old. Table 1 shows further demographic breakdown.

\* Ross Fishman, Private practitioner, Palatka, Florida

\*\* Marcio Guelmann, Associate Professor and Chair, Department of Pediatric Dentistry, University of Florida, Gainesville, Florida

\*\*\* Enrique Bimstein, Professor, Department of Pediatric Dentistry, University of Florida, Gainesville, Florida

All correspondence should be sent to: Dr. Marcio Guelmann, Department of Pediatric Dentistry, P.O.Box 100426, Gainesville, FL, 32610-0426 U.S.A.

Telephone: (352) 392-3195

Fax: (352)392-8195

Email: mguelmann@dental.ufl.edu

**Table 1: Demographic Data**

	Group 1		Group 2	
	Boys	Girls	Boys	Girls
Caucasian	25	6	21	14
African American	6	10	5	7
Hispanic	0	3	2	0
Asian	0	0	1	0
<b>Total</b>	<b>31</b>	<b>19</b>	<b>29</b>	<b>21</b>

**Age**

Figure 1 illustrates the children's preference for restorative material based upon age. Although younger children liked more colored restorations than the older group, both groups chose resin composite as their preferred restoration of choice. Stainless steel crowns (SSC) were more popular on the older group, but both groups rarely selected amalgam as their favorite. These differences were not statistically significant ( $P>0.05$ ).

**Fig. 1- Preference by Age**



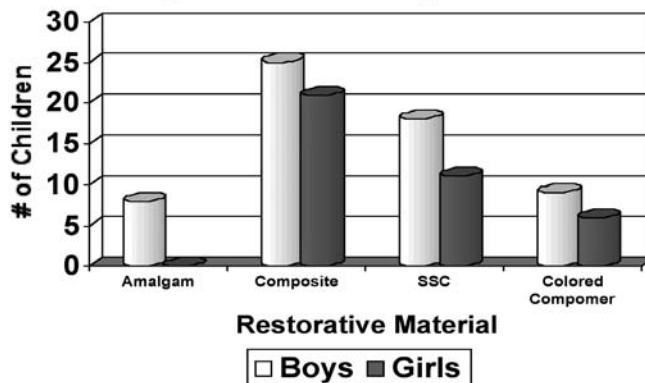
As to the relationship between age and the type of restoration a child least prefers, group 1 selected stainless steel crowns (38%) just over amalgam (30%). For group 2, colored compomers (37%) were followed by stainless steel crowns (27%). Resin composite was the fewest selected by both age groups.

If a restoration was necessary, both age groups selected resin composite as the preferred "filling" (44 percent and 53 percent respectively). Amalgam was the restorative material children 5 to 8 year-olds wanted least in their mouth (14%). However, amongst the 9 to 12 year-olds, amalgam and stainless steel crowns were equally disfavored (8% each).

**Gender**

Analysis of the distribution of restorative preferences by gender revealed a significant ( $P=0.03$ ) higher preference for resin composite by females (55%). Figure 2, in fact, shows no females choose

**Fig.2 - Preference by Gender**



amalgam. Although there was no significance amongst males, resin composite was visually preferred the most, and amalgam least. Males also choose stainless steel crowns and colored compomers slightly more than females.

**Ethnicity**

No statistical significance was found for ethnic influence (Figure 3). African-Americans, however, chose SSC (43%) and resin composite (39%) most often. Resin composite (52%) was the material visually fancied by Caucasians. African-Americans and Caucasians cited amalgam the fewest times (7% and 9% respectively).

For the least preferred restorative material, Caucasians pointed to SSC (38%). Amalgam and colored compomer were equally disfavored the most by African-American children (each 29%).

Given the choice of what type of restorative material a child would want in their own mouth revealed no statistical differences amongst ethnic groups. Caucasian children selected resin composite (55%) most often, whereas, African-American children preferred stainless steel crowns (43%). All of the ethnic groups listed amalgam as the restorative material wanted the least.

**DISCUSSION**

This study expands upon the research of Peretz and Ram<sup>1</sup> by questioning children treated in a University based practice as opposed to a private practice population. In addition, children in this study had the choices of amalgam, resin composite, stainless steel crowns and colored compomers as opposed to amalgam and resin composites only.

Both age groups chose resin composite as their preferred restoration. This is consistent with Peretz and Ram findings.<sup>1</sup> In addition, this finding is also in accordance with the parents preference for "white" teeth.<sup>5,6</sup> This result likely indicates a cause and effect relationship with pediatric dentist's preferences to use resin composite as opposed to other available restorative materials. Pediatric dentists in Florida and Australia prefer to use resin-based materials.<sup>12,14</sup> Not all geographic locations, however, prefer to use resin-based materials in restorations. For instance, pediatric dentists in California primarily covet amalgam. These dentists do not completely forgo resin composites in restorations, and will use resin-based materials citing to "patient preferences" (86%).<sup>15</sup>

In this study, amalgam was seldom chosen by both age groups as a preferred restorative material. Peretz and Ram's study showed similar results pertaining to the 7-12 year olds; however, the younger age group preferred amalgam slightly over composite (22% to 17%). To explain the different preference between the two age

groups, the authors noted that younger children desired a noticeable restoration.<sup>1</sup> "Silver" fillings are more conspicuous than resin composite. This study provided two additional restorative materials for young children to select from: colored compomers and stainless steel crowns. Both colored compomers and stainless steel crowns are more visible than resin composite in that their color composition does not blend in with the coloring of one's tooth. Furthermore, color compomer and stainless steel crowns might have greater visibility than amalgam. If Peretz and Ram<sup>1</sup> properly concluded that the younger age group preferred amalgam due to its visibility, the results of this study would likely show a preference for color compomer and stainless steel crowns in addition to amalgam.

In this study, the children in Group 1 (5-8 year olds) preferred colored compomers more than Group 2 (9-12- year olds). Again, the desire to show off their novel restorations to their cohorts may explain why the younger children chose colored compomers more often than their counterpart. The older children, however, may have been driven away from treatment they perceive as nonconforming or unpopular due to increased body self-awareness and peer pressures to assimilate.<sup>19</sup> This result contrasts the study of Croll et al, who found 7-11 year olds the greatest supporters of the colored filling concept.<sup>4</sup> A finding by Shulman et al is another interesting contradiction to this current study. Younger children in that study were significantly more critical of tooth esthetics than older children, albeit in regards to anterior teeth.<sup>5</sup>

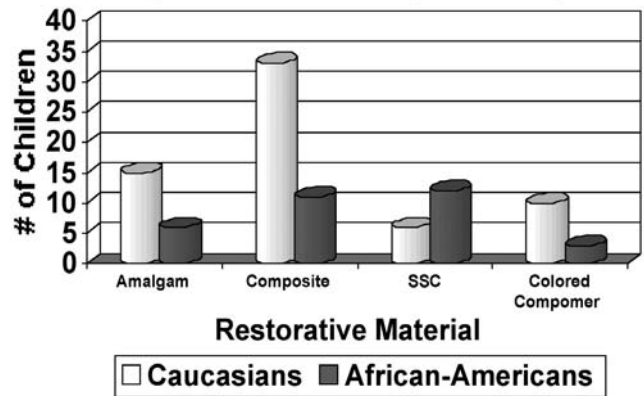
The only significant difference between genders was that females chose resin composite over other restorative materials at a greater percentage than males chose resin composite over other restorative materials. This outcome is consistent with the results of Peretz and Ram's study, confirming a popular hypothesis and recent finding by Shulman and colleagues that girls are more critical about tooth esthetics than boys.<sup>1,5</sup> Both females and males seldom listed amalgam as their preferred restorative material. Peretz and Ram noted a similar outcome when children chose between amalgam and resin composite.<sup>10</sup> The children least preferred the "silver" filling finished last even with the additional choices of color compomer and stainless steel crowns.<sup>1</sup>

As for ethnicity, current research has investigated the relationship between ethnic groups and caries prevalence, but little research exists concerning preferences for restorative material. Although no statistical significance exists between ethnicity and restorative preference, an interesting trend is noticeable. Caucasian children overwhelmingly selected resin composite as the restorative material they enjoyed the most, whereas African Americans liked stainless steel crowns. This raises an intriguing question: Are African American children attempting to emulate their role models by selecting a restoration they deem similar in stainless steel crowns? The proposition that children try to imitate adults such as actors, entertainers, and athletes they see on television is often cited in present day society.<sup>20-22</sup> Many of these famous adults, particularly those in the rap music industry, are African Americans and enjoy displaying their success by wearing flashy types of jewelry, including "gold teeth".<sup>23</sup> This study cannot establish definitively any correlation between the African American ethnicity and the preference for stainless steel crowns, however it certainly poses the possibility that such a relationship exists. Much more research is needed on this inquiry.

There are some limitations in this study that require mentioning. The sample size of 100 respondents may be insufficient to represent

the general population of Florida or the USA. Also, some ethnic groups either are underrepresented or not represented at all (i.e. Hispanics, Native Americans, and Asian Americans). Another limitation is the participating population represents an institutional sample as opposed to those children in a private practice setting.

Fig. 3 - Preference by Ethnicity



CONCLUSIONS

1. Children preferred composite resin the most and amalgam the least, regardless of age or gender.
2. Caucasian children selected composite resin while African-Americans preferred stainless steel crowns.
3. Early interest in colored compomers was seen in children who were young, male and/or Caucasian.

REFERENCES

1. Peretz, B.; Ram, D.: Restorative material for children's teeth: preferences of parents and children. *ASDC J Dent Child* 69:243-248, 2002.
2. Croll, T.P.; Riesenberger, R.E.: Customizing resin orthodontic appliances. *Quintessence Int* 17:433-436, 1986.
3. Maiolani, S.: "Characterized" removable orthodontic appliances. *Dent Cadmos* 57:107-13, 1989.
4. Croll, T.; Helpin, M.; Donly, K.: Multi-colored dual-cured compomer. *Pediatr Dent* 26:273-276, 2004
5. Shulman, J.D.; Maupome, G.; Clark, D.C. ; Levy, S.M.: Perceptions of desirable tooth color among parents, dentists, and children. *J Am Dent Assoc* 135:595-604, 2004.
6. Vallittu, P.K.; Vallittu, S.J.; Lassila, V.P.: Dental aesthetics – a survey of attitudes in different groups of patients. *J Dent* 24:335-338, 1996.
7. Wang, N.J.: Is amalgam in child dental care on its way out? Restorative materials used in children and adolescents in 1978 and 1995 in Norway. *Community Dent Health* 17:97-101, 2000.
8. Spencer, A.J.; Brennan, D.S.; Szuster, F.S.: Changing provision of restorative services in Australia. *J Dent* 22:136-140, 1994.
9. Nash, K.D.; Bentley, J.E.: Is restorative dentistry on its way out? *J Am Dent Assoc* 122:79-80, 1991.
10. Christensen, G.: Restorative dentistry for pediatric teeth. *State of the art* 2001. *J Am Dent Assoc* 132:379-381, 2001.
11. Widstrom, E.; Forrs, H.: Selection of restorative materials in dental treatment of children and adults in public and private dental care in Finland. *Swed Dent J* 18:1-7, 1994.
12. Tran, L.A.; Messer, L.B.: Clinicians' choices of restorative materials for children. *Aust Dent J* 48:221-232, 2003.
13. Wendt, L.K.; Koch, G.; Birkhed, D.: Replacements of restorations in the primary and young permanent dentition. *Swed Dent J* 22:149-155, 1988.
14. Guelmann, M.; Mjor, I.: Materials and techniques for restoration of pri-

Downloaded from http://meridian.allenpress.com/jcpd/article-pdf/31/1/1/1749500/jcpd\_31\_1\_ng7122836mp04v15.pdf by guest on 14 December 2024

- mary molars by pediatric dentists in Florida. *Pediatr Dent* 24:326-331, 2002.
15. Pair, R.L.; Udin, R.D.; Tanbonliong, T.: Materials used to restore class II lesions in primary molars: a survey of California pediatric dentists. *Pediatr Dent* 26:501-507, 2004.
  16. Mandari, G.J.; Truin, G.J.; van't Hof, M.A.; Frencken, J.E.: Effectiveness of three minimal intervention approaches for managing dental caries: survival of restorations after 2 years. *Caries Res* 35:90-94, 2001.
  17. Gladwin, M.A.; Gladwin, S.C.: A survey on patients' attitudes and perceptions concerning dental restorative materials. *Am J Dent* 2:101-4, 1989.
  18. Hancocks, S.: The perception of beauty. *Br Dent J* 193:543, 2002.
  19. Burden, J.: The influence of social class, gender, and peers on the uptake of orthodontic treatment. *Eur J Orthod* 17:199-203, 1995.
  20. Tickle, J.J.; Sargent, J.P.; Dalton, M.A.; Beach, M.L.; Heatherton, T.F.: Favourite movie stars, their tobacco use in contemporary movies, and its association with adolescent smoking. *Tob Control* 10:16-22, 2001.
  21. Mail, P.D.: Early modeling of drinking behavior by Native American elementary school children playing drunk. *Int J Addict* 30:1187-1197, 1995.
  22. Wyrwicka, W.: Imitative behavior. A theoretical view. *Pavlov J Biol Sci* 23:125-131, 1988.
  23. May, M.: The gold standard of style - no longer just for tough guys, glittering grills go mainstream. *San Francisco Chronicle*. May 1, 2005.