

# The Ideal Doll: The Optimal Design for a 12-Inch Doll to Combat Negative Influences

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## ABSTRACT

Historically, 12-inch dolls have been modeled after the “ideal woman”, with unrealistic proportions of adult females. These dolls have been shown through previous research to contribute to the negative body perception that is found amongst the youth. When efforts were made to make dolls more inclusive, the body remained a curvy, sexualized design. These dramatic proportions encourage young children to compare their own self to the doll creating these negative body perceptions. I used data from the Centers for Disease Control (CDC) and the World Health Organization (WHO) to find the average body measurements of girls 5-10 in order to find the average body type of the girls who are most likely playing with 12-inch dolls. Then, I converted these measurements to a 12-inch scale. From there, I used a 3D model generator to help design a doll with those average measurements. After my doll was designed and constructed, I used dolls from the past and present to compare the body types of each doll. The doll I constructed has a more childlike shape, in comparison to the other dolls who have more hyper-skinny or hyper-curvy figures. My doll is more akin to what real girls look like, creating less of a dramatic comparison from the young girl body to the dolls. This, in an ideal setting, lowers the negative body perception of young children.

## **Introduction**

Dolls have been prevalent throughout history transforming to adapt to trends and available materials. Regardless of the intended purpose, dolls have remained a continuity with their popularity among children (History of Dolls, 2022). In the 1950s, “Barbie” came surging into the market. The adaptation of these dolls that stood around a foot tall, known as 12-inch dolls, became highly manufactured after the immediate success of “Barbie” (Stone, 2010). 12-inch dolls have the ideal of a teen-adult age figure but stand with highly cartoonish proportions.

Despite the joy that these dolls are designed to create, there arose a major issue with modern dolls with their design. In reported studies, the overly cartoonish proportions of these dolls lead to childhood body image issues, which will be discussed later in this paper (Dittmar et al, 2006). Children and their perception of their bodies is nothing new (Jongenelis et al., 2020). However, within this study, I will be focusing directly on the way culture can influence children's perception of themselves. There remains a significance in the way that children's toys can damage a mindset, which led me to conduct my current research.

Within my research, I aimed to answer the question: What is the best way to design the body of a 12-inch doll to minimize the negative effects of body perception on girls 5-10 in America? This is a creative process design and an innovative approach to a modern redesign of the typical 12-inch doll. The ultimate goal of this study was to achieve a better way to combat body image issues that occur from 12-inch dolls.

## Review of Literature

### Doll History

Dolls have been recorded throughout history from as early as 2000 BC amongst Egyptians. These were wooden paddle dolls without a specific purpose known. Dolls have been used for a multitude of reasons. There are records of dolls being used for religious purposes and, most importantly, as children's toys. With children's toys, the specific reason is associated with the learning opportunities that arise from humanoid figures. There is a comforting and nurturing aspect that dolls provide children. For example, baby dolls teach children to learn how to care for others. This has always been the main goal of children's toys, but over time things have been distorted (History of Dolls, 2022).

There are many different eras of dolls. As stated, there were wooden paddle dolls from Egypt in 2000 BC. In other regions of the world during this time era, there were also dolls made out of materials that were locally sourced such as wood and sticks. Their purpose was also more focused on religion and rituals that were practiced during that time. As the 16th century began, dolls became more manufactured instead of handcrafted. An example of this is clay dolls in Germany, which were made with clothing trending at the time. The next biggest era in doll creation was the Victorian era. This was the rise of porcelain dolls (History of Dolls, 2022). The big impact of these dolls is prominent in more than just the popularity of porcelain dolls. There were issues with the domestic aspects of these dolls with things like their doll houses (Chen, 2015). These problems will be discussed later on, however, this was the beginning of concerns involving the negative impacts of these dolls. These concerns have only been heightened as dolls become mass manufactured, bringing us to the point of "Barbie". "Barbie" and her era of 12-inch dolls started in the 1950s. This was the beginning of the era of 12-inch dolls, also known as Fashion dolls. The proportions changed from the childlike form of porcelain dolls to the appearance of young women with "Barbie". "Barbie" created this new generation of dolls that is still highly popularized today (Stone, 2010).

One of the biggest downfalls of "Barbie" is associated with the early 2000s and their connotations with being overly thin. In the early 2000s, there was a popularized increase of trends centering around being size 00. This trend shifted to "Barbie" and her look. A study that was conducted in 2006, searched for the effects of playing with Barbie dolls on girls ages 5-8. It was found in this study that these girls that played with Barbie showed lower body self esteem and the desire to be thin. The implications suggest that these impacts can lead to disordered eating and weight cycles (Dittmar et al., 2006). Moving into the 2010s, there was the continued use of hyper-skinny dolls. "Monster High" was a brand that arose in 2010 created by the same company as "Barbie", *Mattel*. Designed by Garret Sander, the main message of this doll line was to embrace oneself, however, this was not reflected in their designs. Parents were not happy with the revealing clothing and overly thin bodies that were being sold (Topolinski, 2021). Due to the distaste expressed by parents about the designs, companies started to shift towards a different approach. As the 2020s came in, doll brands focused on achieving a different body type, as the trends shifted. While these dolls were not as skinny, they had dramatic figures with oversexualized curves.

### Doll Issues and Revisions

There are several issues that arise in the doll community. In the Victorian era, with the rise of porcelain dolls and doll houses, there was an issue with the portrayal of the role of women. Dollhouses and the dolls involved showed miniature versions of a stereotypical family. It confuses the difference between imagination and reality, where children can be confused about a family dynamic. Oftentimes, the "mother" doll is shown to be the primary source of all cooking and cleaning in the household, which can create stereotypes of what society thinks women should act like (Chen, 2015). The Victorian era of femininity is out of date and is not necessarily depicting the same women of today. Femininity was determined by men and their opinions (Moore, 2016). However, even by today's standards, there is still evidence of gender stereotyping within children's media and toys. In a study conducted by Sarah M. Coyne and others

(2016), they investigated some effects of “Disney Princesses” and their portrayal of women. It was found that the princesses shown on the movie screen were stereotyping women into a sexualized nature. Girls are supposed to feel connected with these characters and play with their merchandise, however, these stereotypes are being pushed onto these girls. With this study, it is important to avoid gender stereotyping. While a lot of these issues stem from the characters themselves, the problem should still be addressed.

The findings of the study about Barbie in the early 2000s discussed earlier, are important to note. After playing with Barbie, the young girls in the study showed examples of body dysmorphia. Body dysmorphia here relates to the disapproval of one’s body type. This issue should not be treated as a light matter to just forget about, as dolls are still being manufactured that have the same drastic, cartoonish features (Dittmar et al., 2006). This is the main issue that is being addressed in the study. In later conducted studies, it was still perceived that “Barbie” and other doll brands pushed children to disordered thinking against their own bodies. Regardless if the doll is hyper skinny or curvy, these dolls project a caricature of what the ideal woman is at that time (Rice et al., 2016).

The ideal doll is not the first attempt at solving these issues. There was a workshop called “Reinventing Barbie” which was attended by tween girls. They came together and designed Barbies that they wanted, not what was being sold on the shelves. The concern about the issues stated above led this conference to come together and address these issues. However, there is not much to be said about the true impact of this study, as they just conducted designs rather than a physical product (Collins et al., 2012). Then, “Barbie” addressed some of these allegations of their skinny dolls by releasing the “Curvy Barbie”. This was a Barbie with slightly bigger proportions than the normal doll being sold. In a study, they interviewed young girls about their opinions of this new doll. While many of them identified with the new proportions, the majority said that this was the most unattractive Barbie doll available (Nesbitt et al., 2019). In a separate study by Jennifer Harriger (2019), they also found that the curvy Barbie was the least liked among young girls. The majority showed positive opinions towards the skinnier Barbies versus the curvy Barbies. Other dolls that are performing the same tactic of making bigger dolls are following the same technique. These dolls, specifically the curvy Barbie, were not made to combat any of the ongoing proportions, which leads to the purpose of this study.

## Body Image in Children

There are several adverse effects of body image issues in children. First, there is the topic of self-objectification. Within a study conducted on 219 children, a majority of them surveyed body checking and self-objectification behavior, focusing on what their bodies look like. A lot of these children also exhibited disordered eating (Jongenelis et al., 2020). In other studies, it was found that most children were aware of dieting techniques and the desire to be thin (Xu et al., 2017). There is also research that suggests that children who are either overweight or obese experience more self-objectification (Petraacci et al., 2013). Children are susceptible to believe in a lot of things, meaning they can be more susceptible to having ill thoughts about their own bodies.

One of the causes, the most important for this study, is the influence of the media. A study done by Milia Tzoutzou (2020) researched the eating habits of cartoon characters in regard to their body type. It was found that less attractive and bigger characters were depicted eating much more than the rest of the characters. This trend leads to the impact on children that associate eating with unattractiveness. As previously stated, children are highly impressionable. Media can highly alter their perception of what is okay and what is not. On another note, different stereotyping within the media also affects body image. It was found that African American children have a perception and judgment of themselves in association with the media depictions of African American characters. They formed their perceptions based on what the media showed them (Heidelberger et al., 2018). Dolls are a significant part of a child’s culture growing up. As the child plays with the doll, they are more likely to use this doll as influential. The key reason for this study is to help combat these issues. When children grow up with dolls that have these distorted proportions, they are more likely to develop the desire to achieve these specific unrealistic measurements, thus making them feel worse about themselves.

However, there is another influence that needs to be discussed. Parental figures and familial reasons also

impact children and their perceptions of themselves. In a study done by Hannah Knafo (2016), she found the impact of a toxic familial life on young girls and their self image. It was found that the major foundation for a lot of body image issues comes from the socio-culture in which these girls are raised. In a different study, it was found that children often mimic the eating habits shown by their parents when growing up (Hajna et al., 2014). While these are both important in relation to children, it is not necessarily a counterclaim to the influence that media has upon a child. Children will always have these familial issues pushed upon them, so there is no reason why the media influence cannot be changed independently. When a child has these issues put onto them, a doll that is not also pushing body image issues is ideal to counteract the impact of parents.

## Gap

From the discussions above, it is yet to be seen that any previous studies focus on matching a doll to a healthy child's body. For example, in "Barbie's" curvy doll line, there was no explicit data to back the doll. With all the issues of body image and dolls coming into effect with each other, it is more important than ever to attempt to find a body type to counteract these issues. There are several popular large-scale doll lines that have used factual data on body types to create a body-positive doll body. The idea of a "child's body" being the goal of my study comes from the ideas presented early. If children are going to use the dolls they play with to base their body perception, it is best to have a doll that resembles themselves. If the doll resembles their own body type, they do not have anything to negatively compare themselves to.

## Methods

### Approach

In this study of "What is the best way to design the body of a 12-inch doll to minimize the negative effects of body perception on girls 5-10 in America?", I used a creative process design and an innovative approach. The approach I chose is related to the end goal of my study. My ultimate goal for this study was to have an end design and product, leaving this approach to be the only one optimal for this form of research. This then leads to my design, which is the creative process. Once again, following the goal of creating this product really requires the design to align with the creative process. Ultimately my method was creative rather than mixed methods. While I found data from other sources, the main priority was not to achieve the sort of data that results from mixed methods.

The method process specifically focused on the creative and artistic route of studies. While I could have conducted either a meta-data analysis or survey to get the data behind the doll, this would not have the most optimal results. My study did not necessarily focus on the data behind the doll, but rather just the design processes itself. Going in-depth with meta-data analysis would be unnecessary in the long term. A survey would not be the best method either, based on the fact that any sort of survey would not cover the entire range of the audience along with the questions needing to be much more personal than they can possibly be. With the artistic method, I would be able to create this end product based on data with the doll being the center of focus.

### Materials

In the actual construction of the doll, I required materials such as *Apoxie Sculpt* (clay), air dry clay, a Dremel tool, thin string, and my conducted designs. The doll will start off with an air dry clay base layered with *Apoxie Sculpt*. This is to minimize the weight of the doll. Airdry clay is significantly lighter than *Apoxie Sculpt*, a plastic like clay. Dremel tools and sandpaper helped shape and form the doll, and the thin string held the doll together similarly to ball-jointed dolls. With the materials I used, there is a safety concern regarding the sanded material when shaping the body

parts. I used a mask and safety goggles to ensure that I would not be inhaling any toxic material.

## Procedures

First I started off with the publicly accessible data. This study required data regarding both the average body size and proportions of children and the healthiest ideal body proportion. Based on previously done research, this is to avoid the poor body perception that stems from the culture and media that surrounds each child. With dolls, it is best to show a representation of the actual child. I did not find these measurements myself specifically to avoid the ethical considerations that would follow. I would not be able to find any data referring to children's body image issues or their body proportions because of the ethical dilemma regarding that choice. I researched the average heights and weights and fed them into a child's clothing measurement chart in order to get general dimensions for my doll. Then, I sketched designs detailing each particular joint and body part, based on a 3D model using the dimensions found earlier. A big aspect of doll creation is the joint methods. These range from ball and socket joints to hinge joints depending on the part of the body. I chose to do the typical 10 points of articulation that are found in most fashion dolls today (shoulder, elbow, wrist, hip, and knee joints). This required several trials in order to form the best blueprint for the physical model. Then I started developing the physical model, this being a prototype doll. Using the blueprints, I made the basic figures with a combination of air dry clay and *Apoxie Sculpt*. From there I sanded and shaped each body part with the Dremel and sandpaper. Using a thin string I fed it through each body part, as it was constructed with a hollow center. This is done similarly to how ball-jointed dolls are created. The decision for the ball joints is because a traditional interlocking joint system used by 12-inch dolls is not available for this use. The clay used is far too fragile to create an interlocking system, thus requiring a different approach. There were likely to be mistakes within this doll, however, these were just noted without any additional repairs as this is just a prototype. Then, I took my doll and compared it to other dolls both from past eras and current.

## Artistic Limitations

There is no way to account for all healthy bodies with one model of a doll. As is human nature, people come in all shapes and sizes and everyone has a different basis of "healthy". The quality and effectiveness of my model will be hard to determine based solely on how this can only be one representation of a child's body. However, that is why I conducted the average just to focus on covering as many bodies as possible.

## Data Analysis and Results

To answer my question to find the best design for a 12-inch doll to minimize the negative effects of body perception, I had to start by finding the optimal body dimensions and measurements on which to base the design. In an ideal setting, negative body perception will be the lowest when presented with a doll based on their own body.

### Data Processing

In Table 1, I have found the average height and weight of each age group I am researching. This data comes from a multitude of sources all conducted in the past several years, these being from the CDC and WHO. At the bottom of the table are the average height and weight in both metric units and imperial units.

**Table 1.** Female age group and respective heights and weights

Age Group	Height (cm)	Weight (kg)
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5	112.2	18.34
6	117.7	20.99
7	123.4	22.65
8	129.3	26.08
9	135.3	28.99
10	141.5	32.29
Average (Metric)	126.6	24.89
Average (Imperial)	49.843 in	54.87 lb

Using this data, it is found that the average height and weight for a female child are 49.8 inches and 54.87 lbs. Using a standard clothing chart provided by *Cat and Jack*, an American children's clothes company, it is seen that the average size is a size medium/size 7.

Using the measurements of chest, waist, and hips, I am able to scale these down to my 12-inch scale. In Table 2 are the original measurements and the scaled-down size. If I were to take the average height of 49.8 inches and scale it to a 12-inch scale, this would be by a 4.15 scale.

**Table 2.** Converted chest, waist, and hip measurements

	Original Measurements (in)	12-inch Scale (in)
Chest	27	6.5
Waist	23.5	5.7
Hip	27	6.5

From here, I was able to formulate my design using the measurements from Table 2.

## Models and Design

Using a program from *Human Shape*, I am able to model out, using average measurements, what the average body would appear to be. This 3D model will help create a reference for my end design.



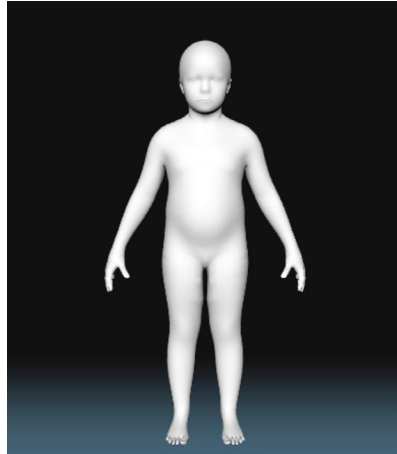


Figure 1

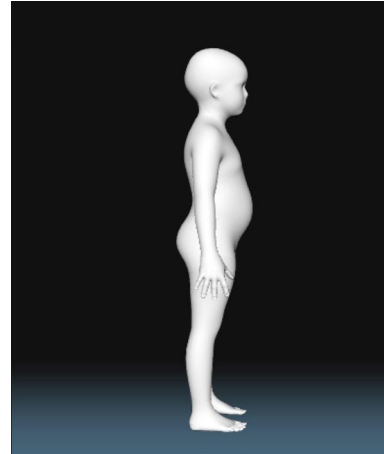


Figure 2

Using Figures 1 and 2, I was able to take that and my measurements and create the blueprints for my doll shown in Figures 3-5. The head is not modeled due to the fact that the head will be negligible in terms of doll body design.

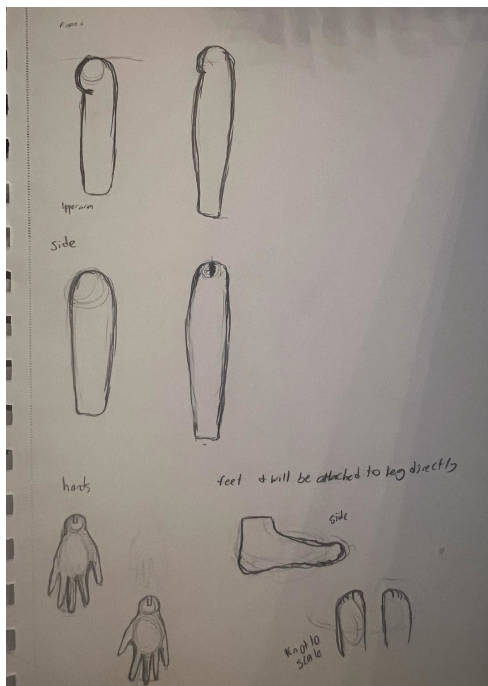


Figure 3

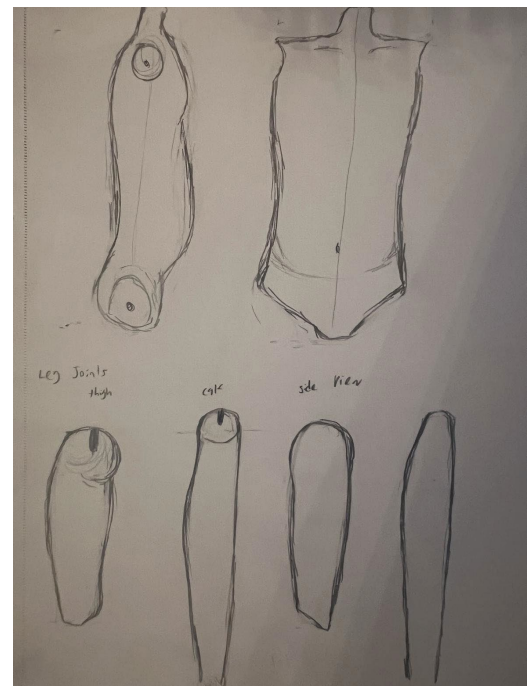
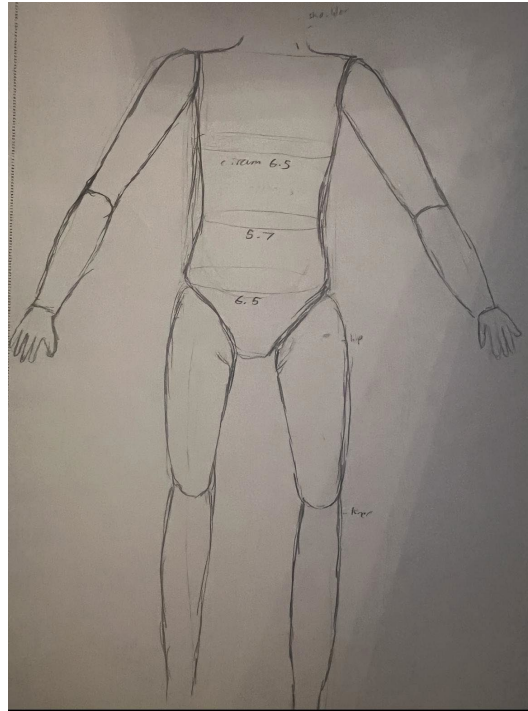


Figure 4



**Figure 5**

Each body part was designed with a special doll joint, this being a single doll joint. In order to maintain the playability of my doll, I wanted to keep it mobile. The majority of dolls on the market come with a single joint. This simple yet durable ball and joint socket allow for a bend and maximum rotation.

## Product

Using the methods described earlier, the final step was to put the doll together.



**Figure 6**



The torso was constructed with the chest, waist, and hips measurements in mind. Through several trials, this part ended up as its desired size.



**Figure 7**

The legs were based more or so on the structure of a 12-inch doll. While children typically do not have this elongated type of leg, typical 12-inch dolls do. This was a compromise on the design I decided to take in order for the overall aesthetics. While this proportion is overall exaggerated, it is still within the model of a child's proportions and modeled as such.



**Figure 8**

The arm design was still based on the 3D model. Similarly to the leg design, this design was a bit more elongated. However, this more accurately depicts the 3D model presented earlier.

After each doll part was constructed, the parts were put together to observe how well the joints worked together. On this prototype, there are several joint connection issues that present themselves. As this is just a rough draft of what this doll could be, these issues will not be addressed, but they are important to note. Figures 9 and 10 are examples of poor joint connections



Figure 9



Figure 10

After these observations, joints were reconstructed in order to fit the doll part more.

## Evaluation



Figure 11. Self Constructed Doll

Figure 11 is the end product of the doll. Despite the construction not being perfect, this prototype is demonstrating the design of what I assume to be the optimal doll to decrease negative body perception. Taking a look at the

end result, you can see a bigger figure and little to no curves. Figures 12-17 are doll bodies from several different doll lines, ranging from the 80s to the current day, for comparison.



**Figure 12.** 1987 Barbie (not in stores)



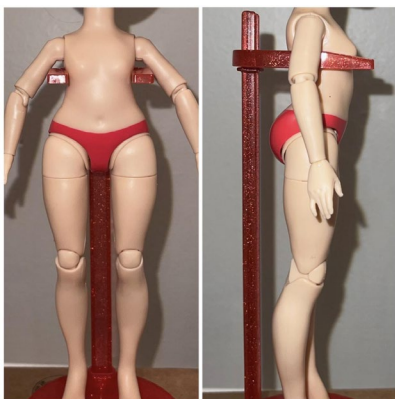
**Figure 13.** 2000 Bratz (not in stores)



**Figure 14.** 2010 Monster High (not in stores)



**Figure 15.** 2022 Barbie (in stores)



**Figure 16.** 2022 Rainbow High (in stores)



**Figure 17.** 2022 OMG Surprise Doll (in stores)

As dolls developed over the years, it is clear to see that modern-day dolls are bigger in terms of body size. 1980 Barbie, Bratz, and Monster High (Figures 12, 13, and 14) all appear with little body mass and are very distinct in comparison

to my design. They were made in an era that glorified thinness, so their design is not surprisingly thin. 2022 Barbie, Rainbow High, and OMG Surprise Doll (Figures 15, 16, and 17) all have this fuller figure more comparable to what my design depicts. In this era, we see more of the beauty standard of a fuller woman, which leaves this change in doll bodies unsurprising. My doll is most comparable to the latter 3 dolls. Rainbow High and OMG Surprise Doll have a similar fuller figure to my design. However, what sets it aside is the enlarged chest and rear ends of these dolls, along with a more defined waist. This is a much more sexualized body ideal that my design does not have. The 2022 Barbie has a more similar chest and rear, however, the body is still on the thin side. Regardless of the similarities, my design is much more childlike than any of the dolls in Figures 12-17. The lack of sexualized features is in hopes of creating a better depiction to match what 5-10 year olds look like themselves.

## Limitations

This design is not perfect. The end result is more juvenile in appearance compared to the dolls found in stores. My limitation for this is that while those dolls have an entire team, 3D modeling, and plastic production, to ensure that their design is as smooth and finished as possible, I lack that equipment. If I were to enhance this study, I would like to try and use 3D modeling and higher production materials. Another limitation found in my process is the overall joint construction. As this was just a prototype, the general design lacks the appearance of a fully finished doll. The joints are not as smooth and clean as they need to be if this was to be sold. Having better access to materials could enhance this aspect, however in its result as seen, the joint construction is lacking.

## Implications

My design shows what a doll would look like if it were to be made to look like a child instead of an adult. This is to hopefully reduce some of the environmental and cultural aspects of child body dysmorphia. My design is made to be a guide for either future manufacturing or personal use. Big toy companies could use this data and design I have found to refine and produce on a larger scale, making this body positive doll widely accessible. It can also be for personal use if someone wanted to make their own doll at their own leisure. My design is only a prototype, so revisions are able to be made. However, as it stands now, this design is a key aspect of creating a new market of dolls that are meant to depict children rather than adults. Hopefully, this research is a step in the direction of changing the doll field and making this design more popularized in stores.

## Suggestions for Future Research

Dolls and doll lines consist of 3 main things: doll bodies, doll faces, and doll clothing. I analyzed in this study doll bodies, their negative influences, and how I think they can be improved. For future research, I believe that analyzing the other two aspects would further change the doll market. The faces/makeup on dolls ranges from each doll line, which is partly due to the artistic style the company was going for and the overall aesthetic. Bratz has heavy makeup and big lips while Barbie typically has more of a clean face. Researching what effects these may have on children can lead to seeing what face may be best suited to the doll market. Along with this is the overall dressing style. Barbie, in 2023, is seen with more casual and girly clothing while Rainbow High and OMG Surprise Dolls are sold with more outrageous and revealing clothing. Researching these effects could lead to better consideration for the implications of doll clothes.



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