A two-part guide for developers and creators

Elizabeth Rood, EdD

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Immerse, play, thrive

Designing VR games to promote youth well-being

The Joan Ganz Cooney Center at Sesame Workshop

ABOUT THE AUTHOR

Elizabeth Rood, EdD, is a senior fellow with the Joan Ganz Cooney Center. An educator, researcher, and writer with expertise in youth development, learning sciences, and participatory design, Elizabeth founded Learning Designs Consulting, which partners with organizations and companies developing new programs and products for kids and families. She has served as vice president of education at the Bay Area Discovery Museum and director of the Center for Childhood Creativity and has a background in formal urban education, as a teacher and principal.

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We are at a special time in the history of immersive technology. After decades of development of head-mounted virtual reality systems focused on professional purposes and adult gamers, something remarkable has happened. Recent price drops have made these headsets affordable for a much wider audience, and to the surprise of almost everyone, a significant audience for these headsets are now... tweens and teens.

This certainly wasn't the goal of the tech companies that have developed the technology, but kids love entering and engaging in these immersive virtual worlds, and are doing so in record numbers, not in a way that is a fad or a novelty, but part of what is clearly a long-term trend. Really, we shouldn't be surprised by this. These headsets provide a way to interact with a virtual world not just with your eyes and fingertips, but through whole-body interaction. And whole-body, physical interaction is how kids prefer to learn about the world.

Other factors explain this trend. More than ever before, parents are afraid to let children play outside unsupervised, but that kind of unsupervised play, formerly in vacant lots, abandoned fields, or "out in the woods," is an important part of growing up. We should not be surprised that in our digital age, children have found places to play together that their parents are unlikely to go. And parents are often willing to allow this kind of play, because they see their children not just zoning out on the couch with their phone or watching television, but moving their bodies, jumping, yelling, and laughing with friends in ways that appear joyful, exuberant, and health-boosting.

Today's children are going to grow up living and breathing immersive experiences. We may be powerless to stop that, but we have tremendous power to ensure that these experiences are as enriching as possible, and we can help parents and children understand how to engage with these experiences in safe ways that help them grow and flourish. *Immerse, Play, Thrive* is an excellent step in this direction—a thoughtful, well-researched report that can help developers and creators better understand how to leverage this new technology to enrich the lives of children and families.

Virtual, augmented, and mixed reality headsets are not just luxury gadgets: they are, and will be, the eyes of the next generation. It is the responsibility of all of us to ensure these eyes empower, enrich, enlighten, and connect children and families in ways that uplift the world. *Immerse, Play, Thrive* is a great way to start.

JESSE SCHELL
Schell Games

Recent research has shown the positive potential of digital play in kids' lives. When designed well, games can enhance children's sense of well-being.[1] Our work set out to build on this research base, asking if some aspects of well-being were particularly present with virtual reality (VR) gaming—gaming designed for play using an immersive headset, such as Meta's Quest. Could designers focus on some key aspects of digital play with VR to help kids thrive?

This question is important, as some VR headsets are now available to kids as young as 10 and as the VR consumer market has grown substantially in recent years, with one in five teens now owning a headset, according to industry research.[2]

To explore how VR gaming could support kids' well-being, we partnered with kids as co-designers, meeting a handful of times over a week, first playtesting with existing VR games and then imagining what kinds of games and experiences we would want to see created.

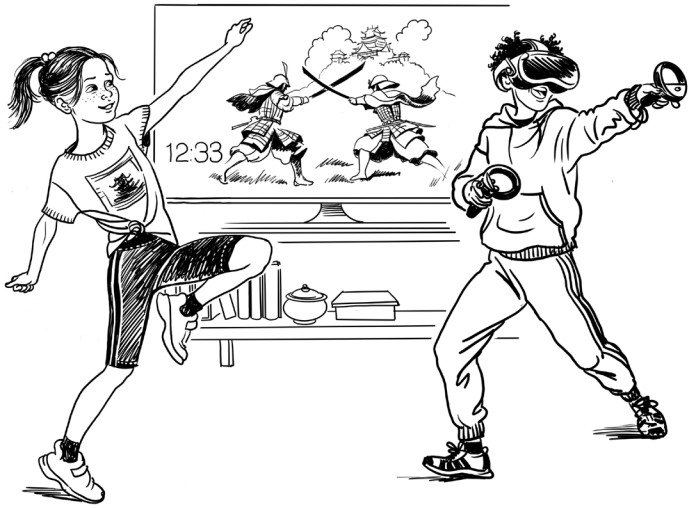
As our research team analyzed kids' responses and ideas, we noticed a connection to an emerging body of research that shows that kids' subjective well-being can be positively impacted by digital play when certain age-appropriate design dimensions are present. (See sidebar , page 8, for more about Responsible Innovation in Technology for Children.)

[1] UNICEF Innocenti, 2024.
[2] XRA, 2025.

RESEARCH SHOWS THAT VR HAS THE POTENTIAL TO OFFER UNIQUE AFFORDANCES AND BENEFITS:

+ Interactivity can increase a sense of agency, lead to positive emotions, and drive intrinsic motivation (McGivney, et al., 2025; McGivney, 2025).
+ "Presence"—the sense of being "there" in an immersive experience, which is achieved through visual, auditory, and sensory engagement—is particularly valuable for learning tasks, facing fears (Bailenson et al., 2025).
+ Trying on another's point of view through an immersive VR experience is linked to deeper empathy (OECD, 2024; Bailenson et al., 2025).

We saw that virtual reality experiences that focus on emotions, relationships, and autonomy can promote kids' well-being. This guide is offered to app developers and designers seeking to make these dimensions of positive youth development North Stars in their design.



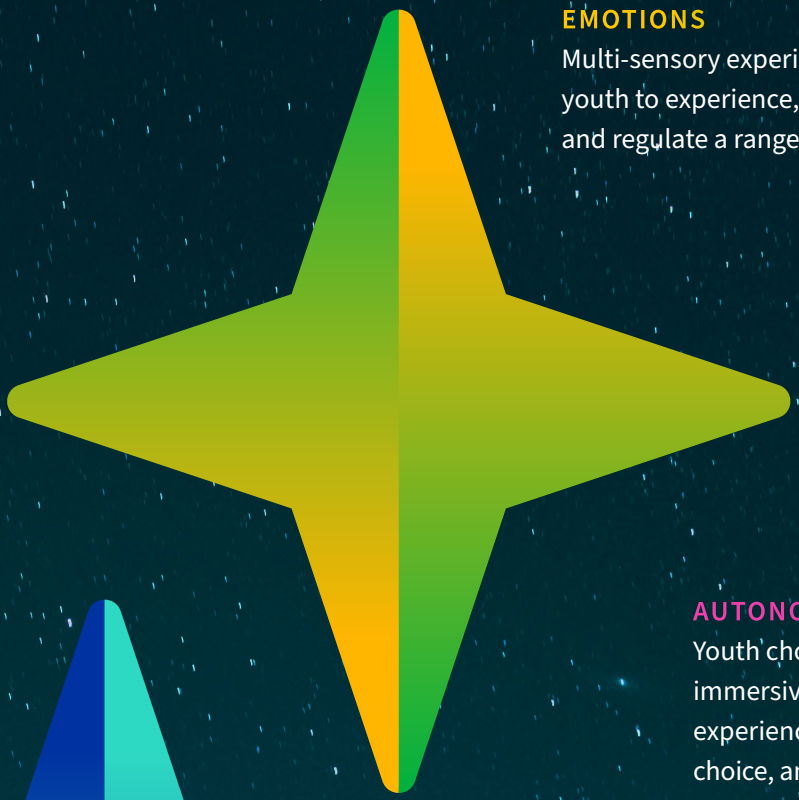
The focus of this guide is preteens and young teens engaged in immersive virtual or mixed reality experiences.

Since preteens are a new audience for VR headset use (see Meta's parent-managed accounts), we engaged in research and design with children ages 10 to 12 and their parents. Eight kids, recruited with our partners at The GIANT Room, partnered with us over the course of a few days. They playtested a handful of current VR games on the first day. In the subsequent days, kids engaged in co-design to imagine and design new games. During the last co-design session, a parent of each participating kid joined us for a focus group.

Throughout this guide, we use the term preteens or tweens to refer to kids 10–12, and young teens to refer to youth ages 13–15.

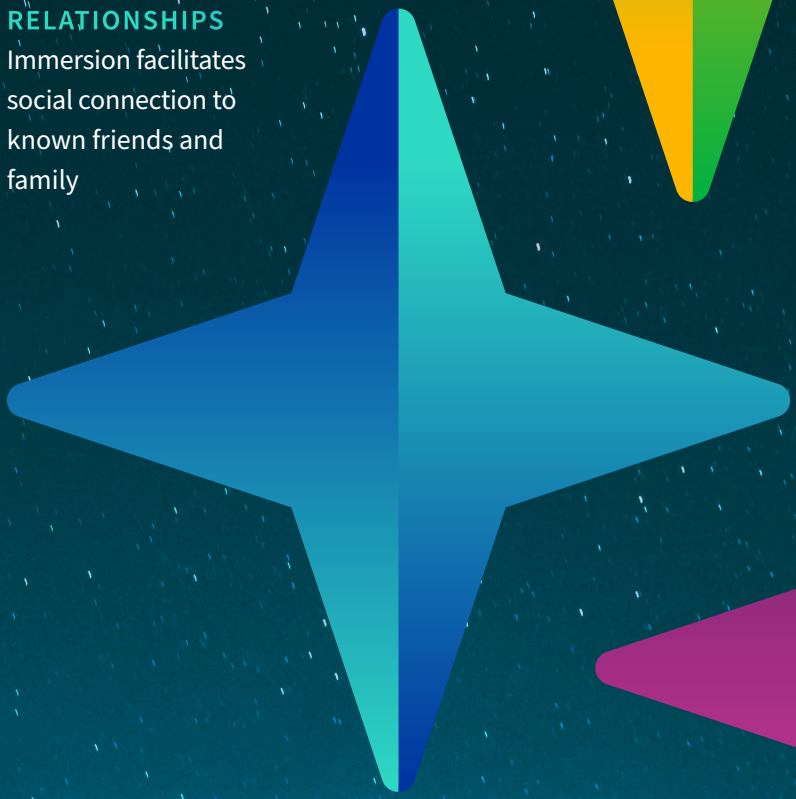
Led by UNICEF Innocenti, the Responsible Innovation in Technology for Children (RITEC) project developed a framework—with young people around the world—for promoting well-being through digital play. The framework lays out eight aspects of well-being. Our guide borrows from that framework, focusing on the aspects of **emotions**, **relationships**, and **autonomy** as particularly central to the design of immersive experiences for preteens and young teens.

Our North Stars



EMOTIONS
Multi-sensory experiences allow youth to experience, recognize, and regulate a range of emotions

RELATIONSHIPS
Immersion facilitates social connection to known friends and family



AUTONOMY
Youth choose amongst safe immersive play pathways and experience feelings of agency, choice, and freedom while playing

Adapted from UNICEF, Innocenti, 2024

Attention to young people's emotions

Play is a critical way that young people learn about their emotions and how to respond to them constructively. In both analog and digital play, children experience a range of emotions, from elation and pride to anger and frustration. They learn to manage strong feelings, build resilience in the face of negative feelings, and see how their feelings and reactions impact others. Research has shown that digital play can offer positive forms of relaxation and calm, as well as provide healthy opportunities to de-stress and escape.[3]

Preteens and teens are still learning how to recognize and regulate their emotions. It is developmentally appropriate for youth to have big feelings and big reactions. Research suggests that immersive technologies may amplify emotions, with studies showing that empathy is heightened through immersive storytelling.[4] Something that a young person experiences as mildly scary on a 2D screen might elicit terror when experienced in first-person 3D.

[3] UNICEF Innocenti, 2024.
[4] Milk, 2015.

Given the "realness" of VR/MR experiences—and the subsequent amplification of emotion—designers have a great responsibility when creating for children and youth. They should pay careful attention to the emotions VR/MR experiences elicit and the intensity of those emotions. It seems fair to assume that content standards created for 2D media, such as those from the Entertainment Software Rating Board (ESRB), might underestimate the emotional impact of frightening or violent content, even when mild or "cartoonish."

Developers should also be aware that common usability issues—e.g., not knowing how to navigate or succeed in a new game, struggling to connect with friends privately, failed parental approval processes—may frustrate or even dysregulate kids in this enhanced immersive context. These kinds of negative emotions might prompt kids to leave the experience or to vent in unproductive ways with other players.

Ideas from Kids

In our co-design sessions with preteens, we learned that **kids want a variety of experiences to elicit a wide range of emotions**. They shared enthusiasm for games that made them feel hyped up, with one kid explaining, "Time equals adrenaline! Which means energetic, exciting, and fun!" At the same time, more calming games such as *Minecraft* and *Animal Crossing* were often shared as favorite non-VR games. Different states of mind—releasing stress after school, having fun with friends, alleviating boredom, enjoying time with family—call for different kinds of games.

Kids reflected on the ways that game elements provided a sense of "presence" that affected their emotional state. While playing *Beat Saber*, several kids noted the **important role of music and haptics**, with one commenting, "It's more immersive; it feels like you're actually in the game."

Another insight from our co-design with kids is the way that **usability and game mechanics can lead to negative feelings, from frustration to fatigue, when not designed well.** The kids often became irritated when games didn't work as they expected or when their bodies hurt from the game play. For example, many children and adults found that throwing bananas while playing a mini game in *Dumb Ways* was challenging, since the physics in the virtual world didn't necessarily align with physics in the real world. Players complained of sore arms, as they tried, unsuccessfully, to throw the bananas farther and harder. In another example, a kid was brought to tears over not being able to connect online to play with a friend. These examples show how usability issues can undermine kids' sense of competence and can leave them with unproductive, negative feelings.

CO-DESIGNED SOLUTIONS: EMOTIONS

Kid and adult co-designers ideated new VR experiences that spanned the emotional range, from calm Zen-like experiences to fighting aliens to watching concerts from the comfort of one's sofa to world travel. Kids reflected on how game elements such as time pressure, music, and the look and feel of animation shift how the game feels to them. *Cubism* is calm, while *Tetris* is tense because of the pressure of time, kids explained. One kid said that *Cubism* would be a great game to play after school to "chill" after a hard day of work. With *Beat Saber*, players can shift the emotional impact by changing levels or varying music, which kids noted and appreciated. The co-designers in our sessions explored how all of our senses (3D sounds, colors, lights, moods, touch through haptics) are involved in our affective state.

The games kids came up with often had tense, scary themes: battling zombies, outsmarting robbers, fighting fires.

Yet in nearly all, the designers balanced negative or strong emotions with release, often in the form of silliness or humor. For example, a game imagined by 12-year-old Elias involved fighting aliens, with a tense energy, but it also included a silly twist: fights occurred while floating in space, making movement comical. The dance feature in *Fortnite* provides another example of offering release from intensity.

Elias's prototype of his Space City game with upside-down avatar and lights on top of buildings

Parents' Perceptions

Parents understand that different game experiences elicit different feelings for kids. They **appreciate the joy and connection that come from playing with friends**. They applaud games, such as *Minecraft* or *Animal Crossing*, that help kids get into a focused **state of flow, offering fulfillment, pride, and delight**. They note that games that boost their children's subjective sense of well-being are often returned to again and again, even over months or years.

Parents also see how digital play can elicit negative feelings—frustration, disappointment, anger—that are, ultimately, constructive for their children. Through digital play, kids learn coping and interpersonal skills and develop resilience in lower-stakes contexts.

At other times, negative feelings coming from gameplay can be less constructive. Tensions between parents and children around digital engagement are commonly cited in the research[5] and were present in our discussions: in-app purchases, screen time interfering with other activities, and negative dynamics in games carrying over to in-person interactions.

Parents expressed particular concern about the ways games seem to be designed to keep kids' attention through what they called "dopamine hits" and how this led to dysregulation when kids were asked to transition away from gameplay. Frustration about this was an animating theme of our conversation with parents. They were more enthusiastic about games that prompt feelings of calm than those that hype their children:

> *"[I'd like VR creators to] avoid full immersion, maintain outside world contact at all times (like Cubism). And to explore and enhance the use of sound, music, ambient effects to elicit an emotional experience. More 'slow play' games, less arcade/time/reaction speed. More calming, centering challenges."*
>
> **– FATHER OF A 10-YEAR-OLD GIRL**

Parents predicted that the immersiveness of headsets would make it hard for kids to transition away from play. (One mother even experienced this when she came to pick up her child from our session, and he refused to take off the headset, ignoring her requests to leave.) With this, parents appreciated immersive experiences designed to be short, with natural breaks in game play, as well as experiences that include prompts to pause play. Overall, parents were most enthusiastic about digital games that elicited positive states like pride, curiosity, and joy.

[5] Modecki et al., 2022; Beyens & Beullens, 2016.

Designing Immersive Experiences for the North Star of Emotions

When designed to enhance "presence," virtual reality can amplify emotions and experience. This is what makes MR/VR exciting and novel. At the same time, designers should be mindful of triggering overwhelm or dysregulation. Adjustable features and customization can help players feel safe, comfortable, and in control of their situation. Long-term engagement hinges on kids' subjective sense that an experience is positive and that they can shield themselves from negative experiences. Additionally, parents may be wary that immersion will exacerbate already-existing dysregulation around gaming; overcoming this skepticism requires quality games and apps designed for kids' emotional well-being.

DESIGN FOR RELATIONSHIPS RECOMMENDATIONS

PAY ATTENTION TO EMOTIONAL IMPACT

READ MORE

LET KIDS CUSTOMIZE EXPERIENCES TO MATCH THEIR MOOD AND ADJUST INTENSITY

READ MORE

AMPLIFY WHAT IS POSITIVE AND FULFILLING; TAKE CARE WITH NEGATIVITY

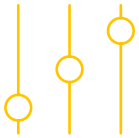
READ MORE

PAY ATTENTION TO EMOTIONAL IMPACT

- Consider how your game contributes to the ecosystem of VR experiences: how does it meet a need for emotional impact, energy level, or life situation not offered elsewhere?
- Design for positive states like calmness, joy, wonder, and pride.
- Consider how "environmental design"[6] sets the tone for how players feel and how this, in turn, influences actions and behavior.
- Consider ways to engage a range of different senses, especially the ones that make VR unique (3D sound, immersive colors and light, haptics).
- Design to enhance physical "presence" leading to higher emotional engagement. Spatial audio and music, in particular, were highlighted by children as impacting mood.

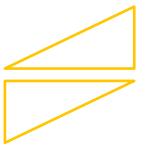
[6] See "Introduction to Biophilic Design" in the Digital Thriving Playbook (2025), for more.

LET KIDS CUSTOMIZE EXPERIENCES TO MATCH THEIR MOOD AND ADJUST INTENSITY



- Allow kids to choose modes that change the intensity of an experience. Consider offering the pass-through camera. Allow kids to turn the level of excitement up or down (e.g., chill mode vs. thrill mode), to choose bright or dark scenes, or to select gameplay free of scary elements.
- Offer some experiences with heightened emotional states (full of energy, competitiveness, anxiousness), as these are enjoyed by kids, but balance intensity or negativity with positive release (e.g., occasions of humor, playfulness).
- Incorporate features that help players to self-regulate (e.g., with breaks, humor, vibe, color, and/or music), particularly for more intense games and experiences.
- Vary music and give kids choice about songs that are played.

AMPLIFY WHAT IS POSITIVE AND FULFILLING; TAKE CARE WITH NEGATIVITY



- Incorporate clear tutorials or in-game support (especially for new players) to help them feel accomplishment and pride, rather than frustration or embarrassment. Include guidance related to physical safety and comfort while using a headset.
- Measure success in terms of delight and enthusiasm for returning to play rather than minutes attention is held.
- Make it easy for players to remove themselves from situations that feel negative or unsafe (e.g., let them block and report, find places of refuge, set boundaries around avatars).
- Design for a full and satisfying game-play experience without requiring in-app purchases. Limit in-app purchases to non-core game functions (e.g., attendance at special events, enhancements to avatars, access to new music) and provide mechanisms for parent involvement.
- Ensure that parents and kids have a clear understanding of any violent or scary elements, including what is cartoonish or mild versus more realistic. Game descriptions should take care to communicate the anticipated emotional impact and ways that 3D or first-person immersion changes the experience.

OPPORTUNITIES OR CONSIDERATIONS FOR KIDS' IMMERSIVE PLAY:

- Immersive and first-person experiences may amplify emotions.
- VR/MR has special capability for eliciting wonder, awe, and joy, so consider focusing on these when designing for young people.
- Embodiment allows for design that makes use of touch through haptics, 3D hearing through headsets, and 3D seeing.
- Existing 2D content standards created for non-immersive experiences may not adequately reflect emotional impacts in VR/MR.
- In metaverse experiences, consider concentrating scary or intense content in certain areas so that players must actively seek out those experiences.
- Safety measures that prevent harm (e.g., using invisible barriers around players to minimize contact, allowing players to easily block others) are essential for emotional well-being.

FIND INSPIRATION FROM THESE DIGITAL EXPERIENCES:

- *Animal Crossing: New Horizons*—Players have opportunities for balance and regulation, since they decide pacing.
- *Super Mario Odyssey*—Players get frequent breaks between intense sequences.
- *Journey*—Players access a wide emotional range and cooperative exploration, with no competitive stressors.
- *Sky: Children of the Light*—Levels are built around different core emotions in multiplayer game; music and positive social interaction are a focus.
- *Ori and the Blind Forest*—Game is balanced, with sadness offset by joyful sequences; gameplay shifts to puzzle-solving after emotionally intense moments.
- *Subnautica*—Game is balanced, with the calm and beauty of the ocean and jump scares and creepy settings in the deep.

Connection of tweens and teens to friends and family

Social connection is essential for well-being and positive development. For preteens and young teens, friendships play a particularly important role. Research from UNICEF Innocenti showed that kids can benefit from relationship-building and gain a sense of belonging through digital play; in their study, the kids who made more connections during digital play reported increases in well-being over time.[7]

Through digital play, children and youth can connect with others and learn important social skills. They can deepen friendships and make new friends. They can practice cooperation and teamwork, experience competition, and teach and learn from others. Digital play allows for connection and belonging for kids who live in remote areas, for kids with disabilities or neurodivergence, or for those who otherwise experience barriers to in-person play.

[7] UNICEF Innocenti, 2024.

Play within families is also an important means of fostering relationships, and VR/MR experiences seem to be well suited to creating opportunities for digital play between siblings or with parents. Being able to cast an experience occurring within a headset to a television or mobile device makes immersion experiences interactive with friends and family, in person, even when only one headset is available. As we consider how to design for relationships with VR, it's best to prioritize experiences that enable play with friends and family, both virtually and in person. In fact, recent research with parents who are early and enthusiastic adopters of VR indicates that family collaborative play time may be one of the most compelling use-cases of VR and MR experiences for kids and families.[8]

CO-DESIGN SOLUTIONS: RELATIONSHIPS

As we designed together, we explored a range of gameplay configurations, from single to multiplayer, with friends and family online and in person, and with different social dynamics. Kids often preferred multiplayer games. The games they designed regularly featured cooperative formats, allowing friends to partner to achieve game objectives. Being able to set up invite-only play spaces within the virtual experience and having fun games to play together was of utmost importance to many kids.

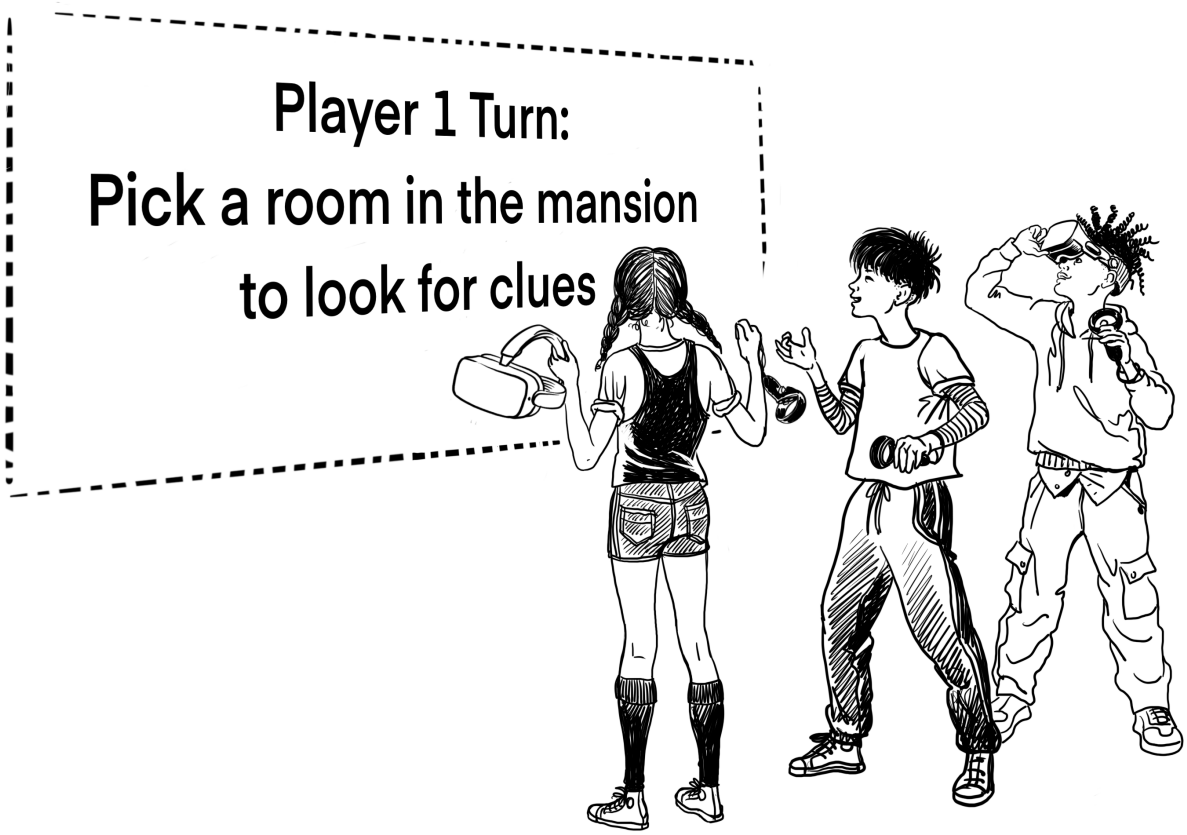
Amara and Talia's "Seven Years of Bad Luck" was a multiplayer game in which each player selects a different role and players team up to explore the world and combat challenges against non-player characters (NPCs). Leo combined *Minecraft* and *Mario* into one game. Similar to Amara and Talia's design, he thought of different roles for each team member to gather resources and food needed to climb up a flagpole and win the game together. Caleb suggested the same game but in an "against" mode.

Leo's game, inspired by *Minecraft* and *Mario*

[8] Allen, 2025.

Ideas from Kids

For the kids in our co-design sessions, digital gameplay with friends online is an important and regular part of social connection. So it was not a surprise that they expressed **strong enthusiasm for the opportunity to play VR games with friends and family**, both virtually (at their respective homes) and together in person, sharing one or more headsets.



Our sessions revealed how important the casting feature is for social gameplay with a single headset. It allows friends to stay involved while taking turns and is useful for parents wanting to be part of the VR/MR experience. At the same time, kids were clear that taking turns with the headset is not as fun as it could be. To respond to this feedback, a few adult designers proposed game ideas that involved turn-taking, with friends observing gameplay through the casting feature while offering tips to the player in the headset.

The kids said, however, that the viewers were "not really playing," indicating a design opportunity for more games like *Keep Talking and Nobody Explodes*, which actively involve a group with a single headset, coupled with mobile devices, to engage play together. Mystery group games in which some players have information while others do not, like the board game *Codenames*, might offer inspiration for this design challenge.

At the same time, it's important to remember that young people may feel uncomfortable or self-conscious being observed by others through the casting feature. As we play-tested different games, for instance, some asked if others could see them play, as they were struggling with intense, objective-driven games. One girl even asked that the casting be turned off. We suggest that designers think about ways that the **casting feature can work in tandem with a single headset to allow for social, cooperative play**. We also encourage games for children to **play collaboratively, particularly in closed or private play sessions**, with their friends.

Parents' Perceptions

When asked about digital play experiences they feel good about for their children (ages 10–12), parents highlighted the way that gameplay allows connection to friends. Parents primarily focused on the **opportunity of deepening and sustaining connections with classmates or other peers that their children know in "real" life**. Parents appreciated the teamwork and collaboration that can emerge from cooperative multiplayer games:

> *"My son was playing Fortnite. The nature of it is very violent, killing. But the part that I really appreciated was I could hear him socializing a lot more. They scream at each other, 'yeah, yeah.' But it was obvious they were working with each other, and there was collaboration going on. They talk to each other through the game, they have to work as a group."*
>
> **– MOTHER OF A 12-YEAR-OLD BOY**

At the same time, parents expressed concern about negative social dynamics, even among known peers and friends, that may be encouraged in competitive games. Parents reflected on how these dynamics can shift behavior and face-to-face relationships following gameplay. One mother explained how she made her 10-year-old stop playing *Fortnite* after observing dynamics that were not promoting positive relationships:

> *"He was playing Fortnite with friends– boys from his class. They're making connections. They're playing together. And then I looked at the group text that they had going while they were playing: Hold on, no way. He would come away from it all amped up and aggressive and snapping at us. And when I looked at the texts, I was like, Okay, this is how they're talking to one another. And then he starts to talk to us like that. No, that's not how we talk. So we took a break from Fortnite."*
>
> **– MOTHER OF A 10-YEAR-OLD BOY**

Parents we talked to were interested in greater visibility into their child's digital play, particularly around interactions with others. They suggested a daily or weekly digest that summarized children's experience and flagged potentially problematic interactions:

> *"Providing a digest would help without infringing too much into the kid's privacy. You can summarize the conversation or flag use of words. How would you know if a major activity happened in a game, like being blocked, or blocking someone?"*
>
> **– FATHER OF A 10-YEAR-OLD GIRL**

Parents seek digital play experiences for their children that enhance relationships, foster cooperation and teamwork, and allow kids to experience good-natured, healthy competition. Playing board games was noted as a non-digital model, something they enjoyed doing with their children. This suggests that VR/MR designers might look to board games for inspiration for models of co-play.

Designing Immersive Experiences for the North Star of Relationships

Kids use digital play as a vehicle for social interaction and connection. This presents both opportunities and challenges for designing games in MR/VR. For virtual reality, the design challenge is clear: Given that most households currently own only one headset, how might creators design interesting, interactive, and cooperative co-play experiences for kids to play in person with friends and family? Headsets provide a novel centerpiece for co-play, akin to a board game, bringing people together for a shared experience. Designing apps with this in mind would fill a much-needed gap in digital play.

Meanwhile, immersive experiences provide valuable ways for friends to connect virtually. They are inherently social, yet risks of unwanted or negative interaction may interfere with their value. Connecting with and enjoying shared experiences with friends and family is the most age-appropriate social set-up for VR/MR experiences for preteens and young teens, so developers may want to optimize for this and include the social value of this practice in their marketing. Older teens may be interested in building online friendships in the metaverse, so content creators should include community norms up front to promote prosocial interactions and include safety by design.

DESIGN FOR RELATIONSHIPS RECOMMENDATIONS

ESTABLISH AND REINFORCE AGE-APPROPRIATE, PROSOCIAL PLAY

READ MORE

ENABLE SOCIAL PLAY WITH FRIENDS

READ MORE

LEAN INTO FORMATS AND MECHANICS THAT BRING KIDS TOGETHER WITH PEERS AND FAMILY

READ MORE

ESTABLISH AND REINFORCE AGE-APPROPRIATE, PROSOCIAL PLAY

- Establish community norms, remembering that kids may need direction about what is and is not acceptable. Communicate expectations and establish clear processes for reinforcing them. The more competitive or aggressive the play, the more essential norm-setting becomes, even with gameplay among friends.

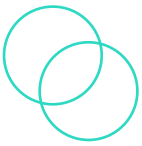
- Ensure relational safety with robust moderation, easy-to-understand processes for avoiding unwanted interactions, and easy-to-use tools for reporting or blocking others. Include barriers around players to avoid unwanted physical interactions and offer spaces or ways for players to retreat from others.

- Apply the same standards for what constitutes “appropriate” interactions in immersive environments as in real life. Proactive moderation, nudges, and filters for concerning communication, along with options for private play and age-based segmentation, help reduce the risk of harms from inappropriate interactions.

ENABLE SOCIAL PLAY WITH FRIENDS

- Make it easy for kids to find and connect to their “real life” friends and family online. QR codes to find and connect to trusted contacts is one example.
- Offer options for closed game play so friends can interact without the presence of strangers.
- Enable voice and chat communication ***among friends*** so kids can safely collaborate, build, and compete.
- Avoid designs that depend on open-ended communication between young players and strangers for effective game play. When communication is needed, consider whether more constrained formats (e.g., emotes, pings, preset text choices) would work in place of voice chat or free-form text chats.

LEAN INTO FORMATS AND MECHANICS THAT BRING KIDS TOGETHER WITH PEERS AND FAMILY



- Design new experiences that allow for in-person play for teams or groups using a single device.
- Consider a range of possible social modes: Collaborative, constructive competition, family playtime, hanging out (see sidebar on page 29 for more).
- Offer tools (e.g., websites, daily/weekly digests) to parents to help them understand the social dynamics of digital play. This could include positive indicators, like most frequent collaborators or what kids created or achieved with others, as well as areas of potential concern, like blocked contacts or conversations flagged for content or tone.

OPPORTUNITIES OR CONSIDERATIONS FOR KIDS' IMMERSIVE PLAY:

- VR headsets with casting transform a solo experience into a social one. Design with this in mind and seize or promote opportunities for multiple people to play together with a single headset. Consider party games and family games. Mystery and clue-giving genres—such as the board game Codenames or murder mystery parties—could offer inspiration. Using a joint approach, where players rotate between headset and mobile play as turn-taking progresses, could open up additional opportunities.

- Embodiment can make negative social interactions more visceral. Whenever voice chat or physical contact is possible, extra care must be taken to protect children and youth from social harms. Providing closed play spaces for kids to connect with invited friends and known contacts is an important design feature for social play.

DESIGN FOR COLLABORATION

How do we work as a team to win, survive, solve problems, build, or create?

Include game mechanics for making collaborative decisions or leaning on varied skill sets or resources from different player roles. Incorporate challenges that can only be achieved through partnership and reward systems that are not zero-sum but, instead, encourage cooperation.

DESIGN FOR CONSTRUCTIVE COMPETITION

How can we enjoy winning and learn to lose against a friend, with a friend against others, or NPCs?

Familiar physical games, like tug of war or field sports, or classic digital games like Mario, car racing, or Minecraft offer inspiration.

DESIGN FOR FAMILY PLAYTIME

How might a VR headset bring us together?

Looking to board games, card games, or other turn-taking games like Jenga for inspiration, consider how a VR device unlocks playful family time.

DESIGN FOR HANGING OUT

How do shared immersive experiences meet our drive to connect and explore together?

Design to make it possible for kids to "attend" cultural or entertainment experiences, to travel, and to learn socially.

FIND INSPIRATION FROM THESE DIGITAL EXPERIENCES:

- *Splatoon 3*—Players cooperate on teams, which encourages shared strategies; they usually play with known friends.
- *Sackboy: A Big Adventure*—Players must work together to progress through stages in each world.
- *Just Dance*—Players can play in groups in person; game needs only one device and can be used for immersive group dance.
- *Nintendo Switch Sports*—Players share multiplayer experiences in movement-based gameplay; ideal for party settings in one room.
- *Lego Fortnite*—Players cooperative in this creative reboot for younger audiences.

Safe opportunities for autonomy and choice

Digital play allows young people to feel a sense of power and control, giving them choices within gameplay.[9] This may look like kids choosing what strategies to use, what they wish to build or create, or how they'd like to customize their avatar. Young people also use digital play to test social boundaries, experimenting with how individual actions intersect with community norms. **Designers should anticipate that kids may experiment with rule-breaking, including intentionally annoying others, and remember that this is age-appropriate** as kids learn to navigate agency in the context of social community.

VR/MR presents opportunities to promote autonomy in safe and age-appropriate ways. Kids can choose to travel the world, go back in time, exercise strategic thinking, navigate complex scenarios, or experience challenges and wonders they would not be able to experience in real life.

[9] UNICEF Innocenti, 2024.

However, unsafe VR environments can lead to harms for young people who, intrinsically, seek out both independence and risk. Parents cannot easily look over kids' shoulders to see what they are doing, as is possible with gaming consoles, unless they use casting as a parental supervision tool. **Safety by design needs to go hand in hand with features that promote autonomy**.[10]

Ideas from Kids

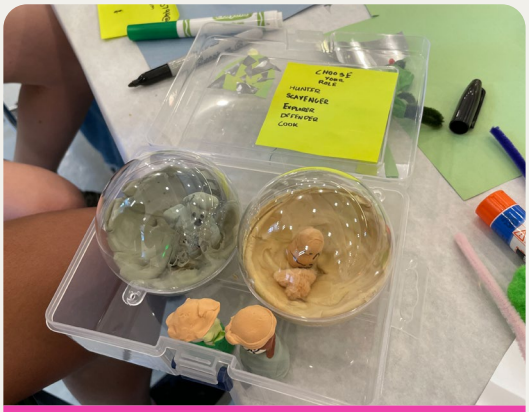
Designing for autonomy was a prominent feature of the games kids imagined through our co-design sessions. In a number of the games they designed, players were able to choose what role to play in the game (e.g., a burglar vs. a kid setting traps in a funny and silly reimagining of *Home Alone*). Making choices about what items or resources to gather for future use (as is common in games as diverse as *Fortnite* and *Animal Crossing*) and unlocking different chosen capabilities as outcomes are achieved are other ways that our kid co-designers wanted to give players choice and agency. Other examples included games with time travel or global travel to destinations of choice and games that involved designing and building for various challenges. The ability to **choose or customize music, color, speed, and other elements to change the vibe of the game** were also important to kids.

While our kid design partners were playtesting existing games, we also saw evidence of ways that **poor user experience can undermine autonomy**. This often occurred when kids were playing an app for the first time, and the goal of gameplay or the navigation of the experience was not intuitive. Kids became frustrated if they felt unable to chart their own course or did not feel competent with the game. Some complained that the game was "boring," others became irritable and quit, and one even teared up. In other words, poorly designed user experience undermined their sense of capability and, therefore, autonomy. We recommend that designers engage kids in playtesting to address areas of confusion and alleviate unproductive points of struggle.

[10] For more on potential risks and the importance of safeguards for children, see Allen, 2021.

CO-DESIGN SOLUTIONS: AUTONOMY AND CHOICE

The games that kids imagined in our design sessions often centered elements of choice. In some, players could select different modes to change game play from competitive to collaborative. In others, players had freedom to design something like a car and then test it out in an immersive world. Another common element of choice that kids incorporated into their designs was the selection of different roles in a game.



Survival game devised by Talia and Amara, where players choose the role of hunter, scavenger, explorer, defender, or cook.

Parents' Perceptions

When asked about digital play experiences that they felt good about, parents expressed **appreciation for games and experiences that enable agency and give their children opportunities to make decisions** about how to play and what the play experience will look and feel like. To parents, self-directed and customized experiences make for more positive and healthy digital play:

> *"[With Animal Crossing, I liked how] she had agency over it. She chose how her surroundings would be, if she'd go fishing. So I support it."*
>
> **– MOTHER OF A 10-YEAR-OLD**

> *"My child likes to create. She spends an exorbitant amount of time customizing figures, designing outfits– the stuff that is adjacent to the game. The enjoyment is with the customization, the creation, it's an outlet I don't mind."*
>
> **– FATHER OF A 10-YEAR-OLD**

In this way, designing for autonomy and agency has the additional value of promoting kids' creativity.[11]

At the same time, the ability for kids to make decisions on certain riskier elements can cause concern with parents. **Interacting with strangers and accessing inappropriate content were two top-line worries for parents:**

> *"I'd like transparency between the VR world and physical reality, especially a way for parents to understand (or track if necessary) the child's experience– what games are they playing, who are they interacting with."*
>
> **– FATHER OF A 10-YEAR-OLD**

Another concern that the parents in our sessions voiced is the way that games are designed to capture and keep kids' attention in ways they deem unhealthy. Parents talked about gaming as "addictive," keeping kids engaged for longer than they believe is healthy and making it hard for kids to step away. There was a worry that immersive gaming might exacerbate this tendency. Parents want **digital experiences their kids can easily leave for breaks and for other activities**, and they would welcome design that **keeps experiences brief and prompts players to take off the headset**. Limited time in a headset aligns to best practices in VR research methodology: adults should spend no more than 20–30 minutes while young children should only use a headset for a few minutes at a time.[12]

[11] See *Potential Power* for more on creativity.
[12] Aubrey, et al., 2018.

Designing Immersive Experiences for the North Star of Autonomy

By providing open exploration, metaverse environments are well suited to offering experiences of autonomy. And the novelty of headsets inspires kids' natural curiosity and experimentation: "What happens if I do this?" Make these affordances a superpower by designing play experiences that are intuitive and/or well guided and with features that encourage exploration and experimentation.

Because written instructions may be passed over, and feelings of frustration or uncertainty can undermine a sense of autonomy, potentially leading to higher churn rates or disruptive behavior, offer multiple ways to engage. Remember that some kids prefer to let their imaginations drive their digital play, while others will be interested in games with objectives. Customization is the name of the game. Since, as one developer put it to us, "the bored player becomes the troll," offer an enriching play environment to keep play positive.

DESIGN FOR AUTONOMY RECOMMENDATIONS

ALLOW CHOICE AND CUSTOMIZATION OF GAMEPLAY

READ MORE

ENCOURAGE EXPERIMENTATION

READ MORE

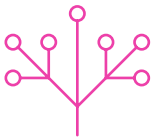
TAKE CARE THAT INDEPENDENCE DOESN'T COME AT THE COST OF WELL-BEING

READ MORE

ALLOW CHOICE AND CUSTOMIZATION OF GAMEPLAY

- Allow young people to choose the role they will play in a game.
- Offer varied ways to approach play, rather than a single objective or pathway.
- Let young people alter the colors, music, and setting or select areas of the game with varied energy.
- Encourage young people to customize their avatars, persona, and in-game objects.
- Give young players choices about how, when, and what they can create and ways to receive “real” feedback on their creations, like test driving a car you built in VR.

ENCOURAGE EXPERIMENTATION



- Make it possible for children to develop their own strategies to make progress. For example, create experiences where there are multiple ways to survive based on the tools and resources the player gathers, traps they set for opponents, or strategies they use to survive in extreme environments.

- Expect and allow for boundary-pushing and tests of the limits of social convention or the physical world; understand these as developmentally appropriate and offer safe ways to test the bounds of rules and norms.

TAKE CARE THAT INDEPENDENCE DOESN'T COME AT THE COST OF WELL-BEING

- Make sure that gameplay, navigation, and safety features are clear, easily accessible, and intuitive so that young people can feel competent and keep themselves safe.
- Demonstrate respect for players when tension arises between kids' autonomy and other core design principles (e.g., safety, norms), by articulating trade-offs so they can understand, learn, and make informed choices.
- Prioritize safety and privacy features and robust moderation to protect kids who are still learning to independently manage digital life; help parents understand the kinds of decisions and interactions kids might experience.
- Avoid features like loot boxes and gambling elements that create unpredictable rewards or financial pressure for kids.

OPPORTUNITIES OR CONSIDERATIONS FOR KIDS' IMMERSIVE PLAY:

- Incorporate opportunities for choice and customization, allowing play approach to change according to preference and context (e.g., a calm mood or creative mode after a long day at school).
- Lean into all the senses to allow kids to curate the somatic experience, including music and 3D sound, haptics, and colors.
- Keep experiences brief; build in natural pauses and breaks that encourage kids to remove headsets and reconnect with the surrounding world.

FIND INSPIRATION FROM THESE DIGITAL EXPERIENCES:

- *Minecraft*—Players freely explore worlds, crafting tools, and roles and choose their game objectives.
- *The Sims 4*—Players choose style of play (tasks vs. exploration) and choose their Sims' home, lifestyle, family, careers.
- *Terraria*—Players pick roles, control over gameplay intensity, and environment.
- *Sky: Children of the Light*—Players can explore the world, solve puzzles, or engage socially; opportunity to lead other players or explore open worlds/missions.
- *Animal Crossing*—Players build their world, choosing how to make use of what they grow, find, and catch; taps into imaginary play.

Pre-teens playtest existing VR games on the first day of our session

A body of research demonstrates that well-designed games for young people can enhance subjective well-being when creators design with particular aspects of well-being in mind. When creating games for VR and MR, developers might first focus on one of the three particular aspects of well-being described in this guide: emotions, relationships, and autonomy. Pairing these dimensions of well-being with quality content can lead to digital play through VR and MR that is developmentally-appropriate and beneficial for preteens and teens.

We encourage designers and developers to carefully consider tensions and trade-offs between these aspects, including the critical lenses of safety and privacy, as you imagine and build new VR games that will delight young people. It's time to leverage this powerful technology for kids' good by creating experiences that enhance feelings, offer connections, and empower decision-making toward a goal of greater youth well-being

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