

# COPING COACH

PLAY THE GAME

FOR PARENTS

FOR KIDS

HOW TO GET HELP

## Application of an internet-based game for secondary prevention of posttraumatic stress following acute medical events

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# DISCLOSURES

- I have nothing to disclose for this presentation.

# CHILDREN AND ACUTE TRAUMA

## High impact / high profile events

- ~ e.g., natural or manmade disasters, mass violence, terrorism
- ~ affect large numbers of children and families all at once

# CHILDREN AND ACUTE TRAUMA

## Lower profile “everyday” events

- ~ e.g., traffic crash, house fire, injury, sudden serious illness, witnessing violence in street or at home
- ~ affect children and families one at a time, out of the public eye
- ~ very frequent – thus MANY children are affected

# WHAT IS TRAUMATIC STRESS?

## Re-experiencing/Intrusion

- “It pops into my mind.”
- “Feels like it’s happening again.”
- “I get upset when something reminds me of it.”

## Increased arousal/reactivity

- “I am always afraid something bad will happen.”
- “I jump at any loud noise.”
- “I can’t concentrate, can’t sleep.”
- Includes aggressive behaviors

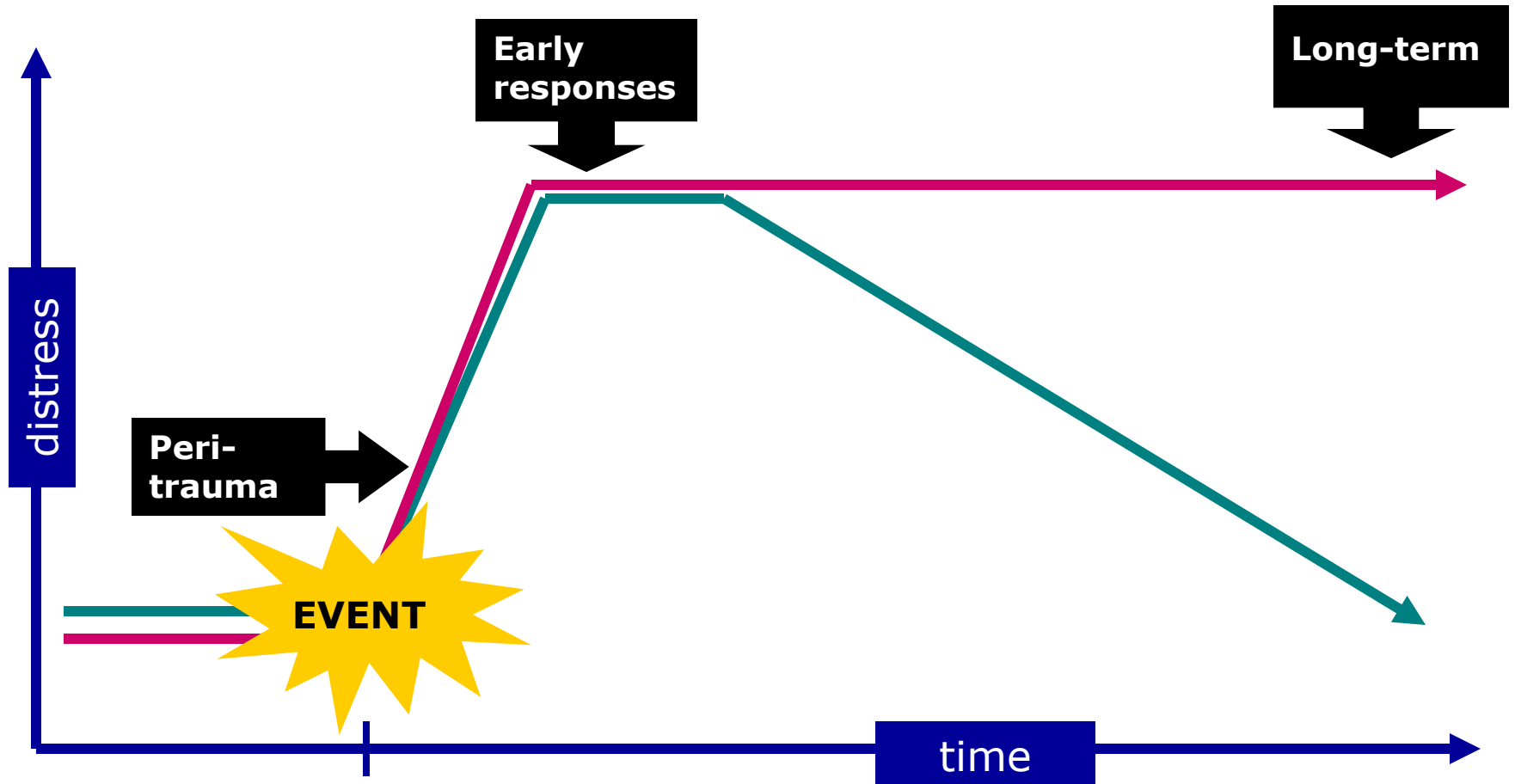
## Avoidance

- “I block it out - try not to think about it.”
- “I try to stay away from things that remind me of it.”

## Persistent negative alterations in cognitions and mood

- “The world is a dangerous place”
- “I am a bad person”

# TRAJECTORY OF RESPONSE TO TRAUMA



# Prevalence:

## PTSS in ill & injured children

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- Meta-analysis (26 pediatric medical trauma studies):

- Average PTSD prevalence rates:

- Injured children 20%
- Ill children 12%

(Kahana, 2006)

- Few studies have included both ill and injured children.
- Landolt (2003) found significant PTSD symptoms 5 to 6

wks after:

- Injury from car crash 15%
- New cancer diagnosis 10%
- New diabetes diagnosis 5%

(Landolt, 2003)

# CHILDREN AND ACUTE TRAUMA

- Acute trauma is very common
  - ~ Who needs our help?
  - ~ Where are they?
  - ~ Few ask for mental health services
- How to reach children & families after acute trauma?
  - ~ In schools, community settings, etc
  - ~ Other systems (e.g. health care, law enforcement)
  - ~ **On the web**



# Process for creating & sharing effective e-Health applications

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## ① **Clearly define specific goals & program theory**

- Use evidence base
- Carefully define intervention targets

## ② **User-centered design process**

- Involve users at every stage of development
- Test usability & engagement

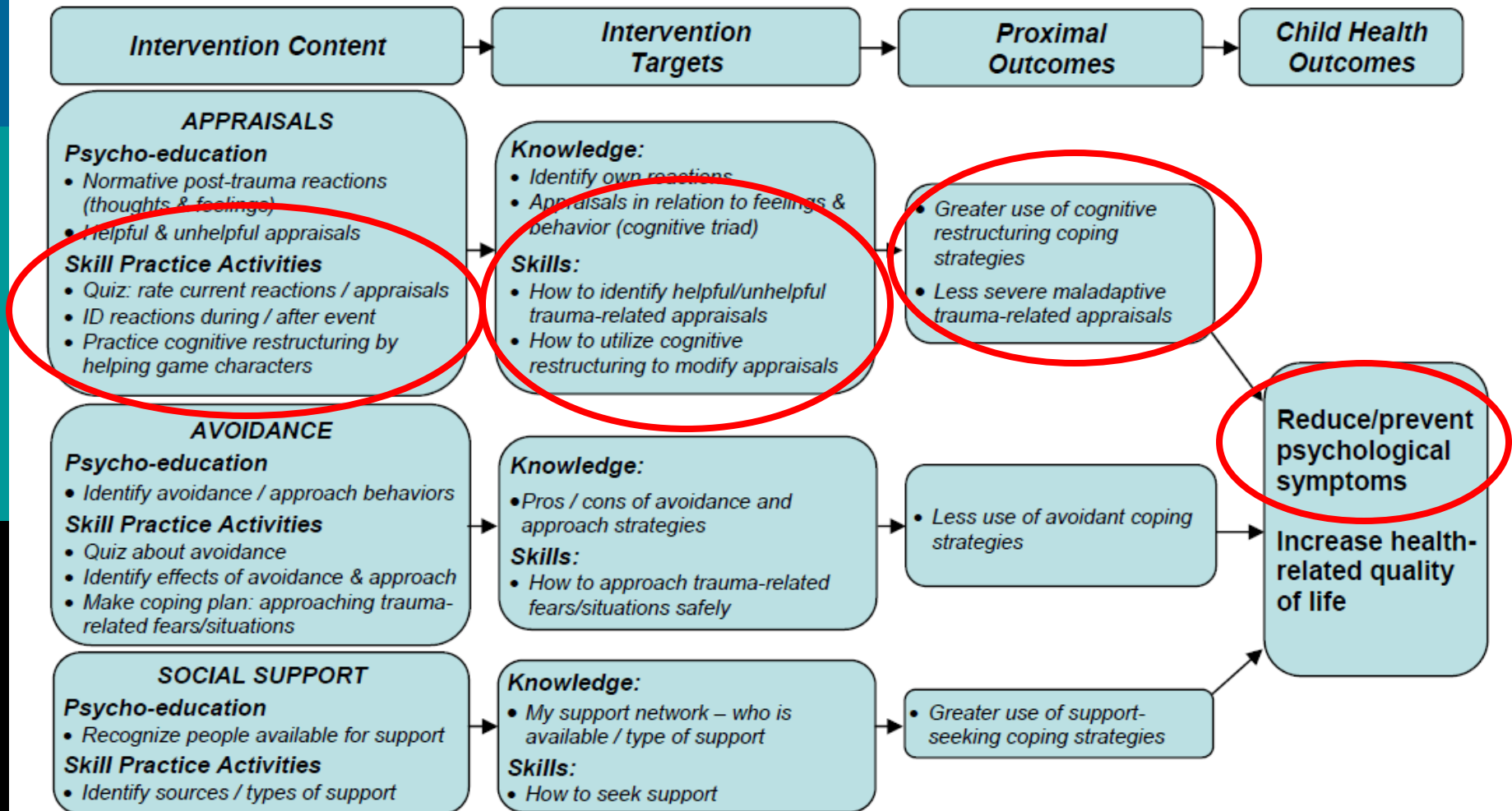
## ③ **Test effectiveness**

- Does it change intervention targets & improve health outcomes?

## ④ **Share and disseminate**

- Test multiple methods for dissemination
- Continually track use - to improve dissemination

# 1. Specific goals & program theory: Coping Coach



# COPING COACH: PROGRAM THEORY

## EVIDENCE-BASED ACTIVE INGREDIENTS

### Understand appraisals (thoughts & feelings)

- Understand normal reactions (thoughts & feelings) after a trauma
- Helpful & unhelpful ways of thinking
- Practice by helping game characters

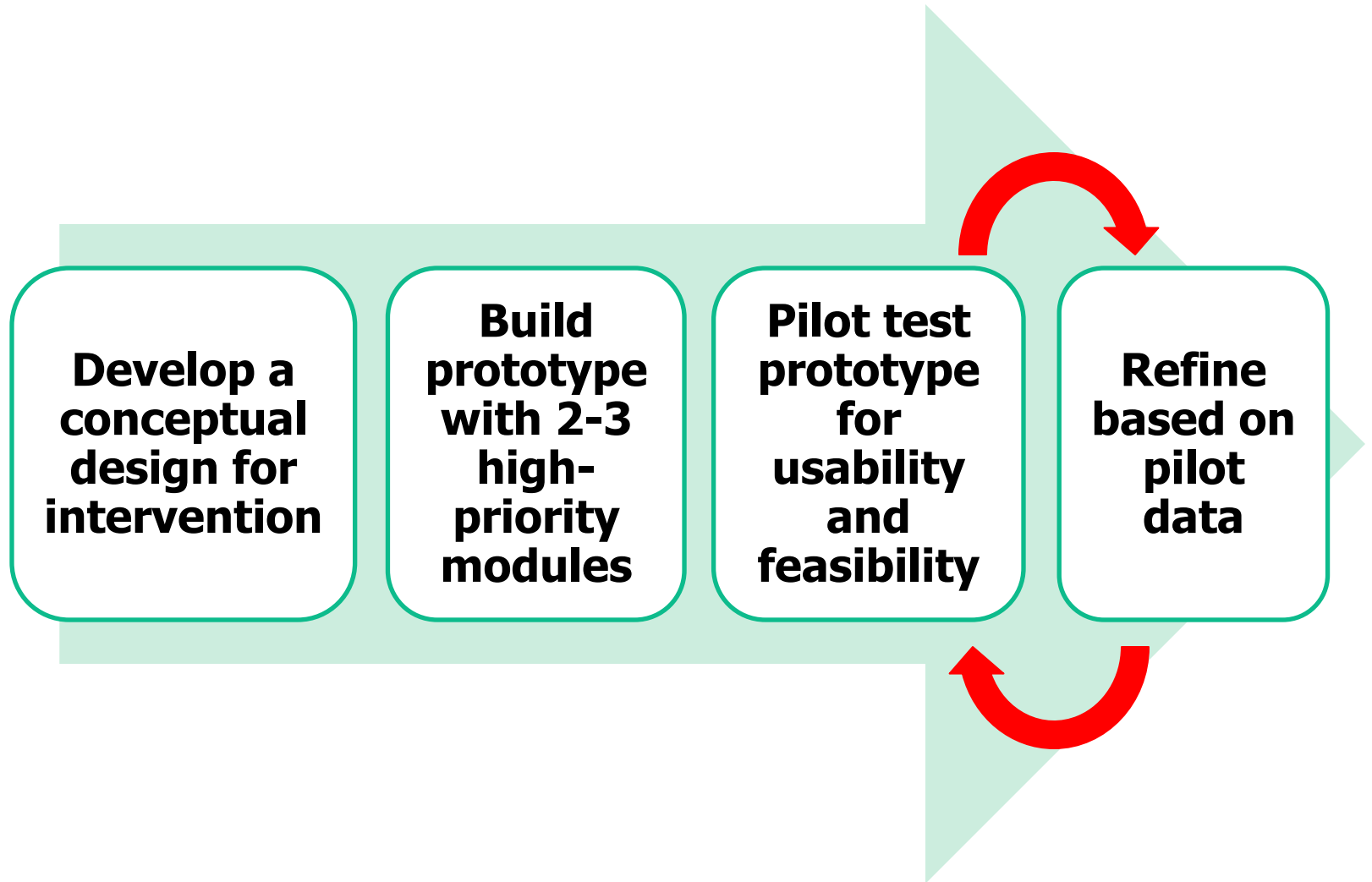
### Decrease avoidance

- Pros & cons of avoidance
- How to approach trauma-related fears / situations
- Practice by helping game characters

### Increase social support

- Recognize people available for support
- Practice giving and seeking support with game characters

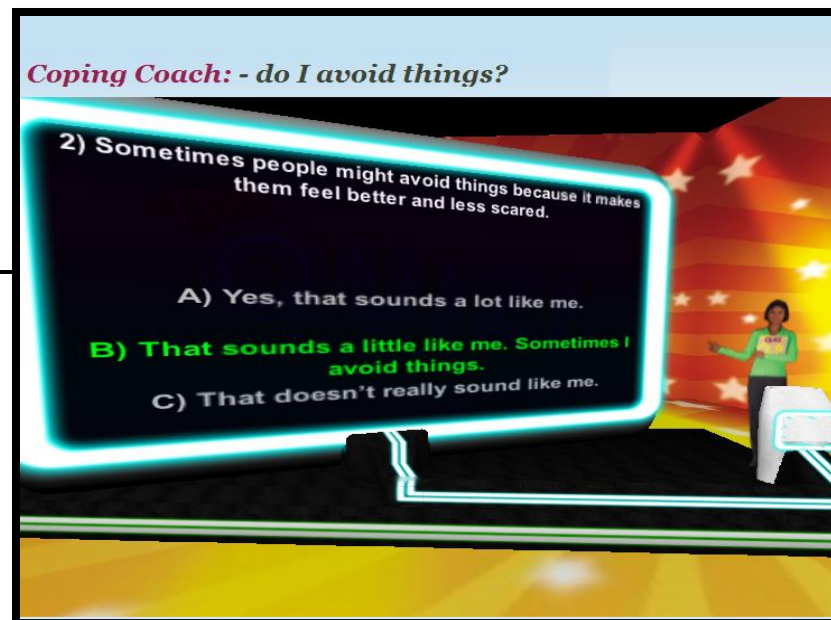
## 2. COPING COACH DEVELOPMENT: USER-CENTERED DESIGN/TESTING USABILITY & ENGAGEMENT



## 2. User-centered design process

### Built prototype 1

- (relatively) low cost
- 2-3 high priority modules
- test usability / engagement



# Conclusions from Prototype 1 Testing

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- Children and parents
  - interested in a web-based resource
  - found information trustworthy

## □ SUGGESTED IMPROVEMENTS

- ✓ Increase interactivity
- ✓ Add audio
- ✓ Reduce text
- ✓ Track progress/ accomplishments throughout
- ✓ Develop overall concept / platform for the activities





# Changes for Prototype 2

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- Game-based, with a storyline
  - Child can see his / her progress through the game
  - Uses points and trophies for reinforcement
  - 3 levels:
    - **Tree world** (Feelings / trauma reactions)
    - **Airship** (Appraisals / re-appraisal skills)
    - **Cloud world** (Avoidance / Approach)
    - Social support woven throughout
- Added music & audio
- Learned from research on “serious games”  
/ “games for health”



# Initial design: UPenn Digital Media students

## Subsequent: Professional design firm (Radiant)

**Coping Coach**  
A 2D game for children at risk for developing Post-Traumatic Stress Disorder

By: Eliot Kaplan and Marley Gilb  
kaplane@seas.upenn.edu, gmar@seas.upenn.edu

Directors: Meghan Marsac, Kristen Kohser (CHOP)  
Adivsors: Joe Kider, Norm Badler (UPENN)

**Thwart General Malware's evil plan!**

Meet General Malware, a squirrel with some nasty tricks up his sleeve. Don't judge him too harshly, however. Perhaps he has gone through a scary event of his own and has not yet learned how to cope.

**You'll never stop me!**

Come to Huckleberry a safe place for those who have recently experienced or witnessed a scary event, such as an asthma attack, bullying, a car crash, or house fire and other natural disasters. You will learn to understand emotional expression and learn what you can do to help control the emotions that make you feel bad. You'll also make friends, play games, and most importantly have fun!

Help the others regain their emotions!

Children's Hospital of Philadelphia  
Center for Injury Research and Prevention  
and the SIG Lab at UPENN

Thanks to Meghan, Kristen, James, Norm, Joe, and everyone else who has given us feedback, advice, and support! Summer 2011



# COPING COACH

PLAY THE GAME

FOR KIDS

FOR PARENTS

HOW TO  
GET HELP

Meet  
coach

Choose  
avatar



Character 4

SCORE: 0



The fourth character choice.



It's very dark in here, and I'm having trouble seeing you. Could you tell me what you look like? Use the arrow keys and the ENTER key to select your avatar.

ENTER to continue



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PLAY THE GAME

FOR KIDS

FOR PARENTS

HOW TO  
GET HELP

Plot /  
story line



But that will all change after I unveil my newest  
and evilest invention yet!



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## 4 character stories:

Asthma attack,  
Car crash,  
House fire,  
Witness violence

SCORE: 260



Hi, I'm Jayla. A few days ago I was playing basketball when all of a sudden my chest got tight and I couldn't breathe right. I didn't know what was happening.

Dialogue: On

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**ID  
reactions  
during /  
after  
event**



It's the worried face you made  
with the Face-o-Matic.



Can you help me figure out how I'm feeling now?  
Choose the face that shows how I feel.

Dialogue: On

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ID  
trauma-  
related  
appraisals

SCORE: 890

LEVEL  
OFF



Can you help me figure out what I'm thinking that is making me feel sad?

- My life is ruined because of the fire.
- **Bad things always happen.**
- I'm glad that it's over, and I'm safe now.
- I will never feel happy again.



Dialogue: On

ENTER to decide

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Logbook  
appears  
after each  
section

## ADVENTURE LOG



## MY THOUGHTS



An example of a helpful thought is:  
What happened to me was scary,  
but now I know what to do if it  
happens again.

A thought that is like me is:  
'I am safe now.'

Something I can say to myself  
to feel better is:



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**Identify  
problematic  
avoidance  
coping**



SCORE: 540

GET  
HEAD



At first I was so worried about another fire that I didn't want to go to bed by myself. So I slept in my brother's room.



Dialogue: On

ENTER to continue

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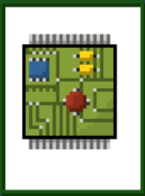
HOW TO GET HELP

WEATHERMAKER 3000

AVOID

APPROACH

Pros/ cons of approach vs avoidance coping



I might be able to beat my fear.

Is this a good thing (+) or a bad thing (-) that happens when you approach? Click on your choice.

at





# 1. Specific goals & program theory:

## Expert review of content validity

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- ❑ Built the game based on program theory. But do we have content validity?
- ❑ Does each activity match the intended intervention target? Likely to be effective in addressing the target? Age appropriate?
- ❑ Expert review by colleagues (from US, Australia, Netherlands, UK, Switzerland) with expertise in child trauma and/or web-based interventions
- ❑ Rated 15 intervention activities on a 0 to 4 scale:
  - Relevance,
  - Effectiveness,
  - Age-appropriateness



# 1. Specific goals & program theory:

## Expert review of content validity

<b>TARGET</b>	<b>Relevance to target</b>	<b>Likely effectiveness</b>	<b>Age-appropriateness</b>
ID emotional reactions to trauma	3.3 – 3.8	2.7 – 3.3	3.1 – 3.8
Re-appraisal skills	3.7 – 3.9	3.0 – 3.5	3.4 – 3.7
Reduce avoidance coping	3.4 – 3.9	3.4 – 3.8	3.6 – 3.9
Increase social support seeking	3.5 – 3.9	2.8 – 3.3	3.6 – 3.7

Illustrative reviewer comments:

### **IDENTIFY EMOTIONAL REACTIONS:**

*"Perhaps also discussing what a child's behavioural reactions may be when sad, angry, worried etc (for example, crying, stamping feet, churning stomach) may offer them more of a chance to identify their feelings."*

### **RE-APPRAISAL SKILLS:**

*"One of strongest sections, teaches link between thoughts, feelings, and actions well and good in identifying concrete thoughts."*

### **REDUCE AVOIDANCE:**

*"Interactive nature of the exercise and the fact that it doesn't 'sugar coat' that there are some positives to avoidance is useful as it makes it realistic for kids."*

## 2. User-centered design (test engagement)

	Child	Parent
Gave good advice	100%	100%
Would use again	75%	87%
Was fun to use	93%	94%
Easy to use	94%	88 %
Directions understandable	81%	64%

## 2. User-centered design (test engagement)

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### Comments from kids:

- ❑ "I liked how I got to express my feelings."
- ❑ "It's fun because it was asking me how I felt about stuff, then I go to put a face in a box to explain how I felt... instead of writing or something."
- ❑ "I like that it gave you questions and you had choices to figure out how you feel"
  
- ❑ "Learned that after you get sick or have an accident you can still make things feel better"
- ❑ "There's more good things when you approach something then when you don't, when you avoid."
- ❑ "I learned that sometimes avoiding situations is good for me and sometimes it's not."

# CONCLUSIONS FROM PROTOTYPE 2 TESTING

- Prototype 2 demonstrated better usability and acceptability
- **SUGGESTED IMPROVEMENTS**
  - ✓ Improve directions for parents
  - ✓ Add audio option
- Move forward with a systematic evaluation

## 2. User-centered design (test engagement) in pilot RCT

- ❑ 72 enrolled at hospital within 2 weeks of acute medical event
- ❑ Age 8 to 12; screen for subjective distress / life threat
- ❑ Randomize to Coping Coach vs Wait list control
  - Start first module in hospital – keep playing at home over next month
  - Reminders via phone / text / email
  - Incentive to finish whole game
  - Encourage repeat play
  - Wait list control – Coping Coach after 12 week follow-up assessment
- ❑ Track all interactions with the game

## 2. User-centered design (test engagement) in pilot RCT

	Child	Parent
Gave good advice	96%	96%
Would use again	92%	93%
Fun to use	92%	90%
Easy to use	96%	90%
Directions understandable	88%	81%
Information is true	100%	96%
Learned something new	80%	56%

## 2. User-centered design (test engagement) in pilot RCT

### Comments from kids:

- “Really good game and so fun to play. Teaches you whole bunch of things that you need to know”
- “Thought it was good. But should give more directions on what to do”
- “[Change the] book, make it into magical tree you could talk to”
- “Make it a little longer”
- “To be able to make your own character”
- “No voice over”

### Comments from parents:

- “My daughter seemed to enjoy it, I felt it was interesting way to explain hospital related events”
- “[Child] had fun. [Child ] didn't realize it was more than just a game, which is good.”
- “More updated graphics, my daughter loved it so it's a real treat, but it looked old“
- “The game looked too young, immature, add levels for different age groups”



## 2. User-centered design (test usability) in pilot RCT

- Text/E-mail reminders
  - ~ 15% mom; 37% child per child report
  - ~ 87% per parent report
- Logging on
  - ~ 33% child report; 87% parent report
  - ~ 99% at least 1x; 54% >1x computer report
- Intervention completion
  - ~ 44% computer report

### 3. Test effectiveness in a pilot RCT

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- Randomize to Coping Coach vs Wait list control
- Baseline, 6 wk, 12 wk, 18 wk assessments
  - Proximal targets at 6 wks
    - Trauma-related appraisals
    - Coping strategies: Avoidance coping, Positive cognitive restructuring, Seeking social support
  - Outcomes at 12 wks:
    - PTSD symptoms, Health-related quality of life
- Results to be continued...

# Summary

## Child feedback at each step invaluable

- Look & feel, functionality

## Early prototype

- Theory → interactive activities
- Test usability & engagement

## Re-design as game

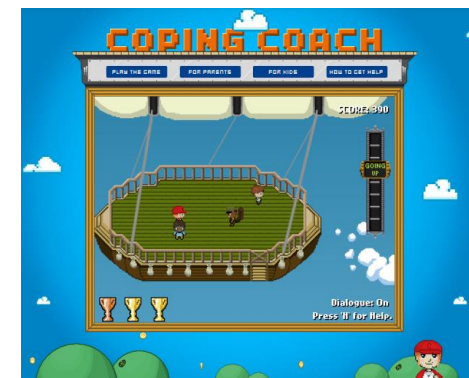
- Built on lessons learned from Prototype 1
- Improved usability & engagement
- Content validity appears strong
- Reported engagement strong

## Challenges


- Completing “enough” of the intervention

## The work continues!

- Complete randomized trial
- Continue development of additional activities



# ACKNOWLEDGEMENTS

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- UPenn Digital Media Program: Marley Gilb, Elliot Kaplan
- Music: Paul Weinstein
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# THANK YOU! QUESTIONS?

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