



Managing Factors that Influence Behavior

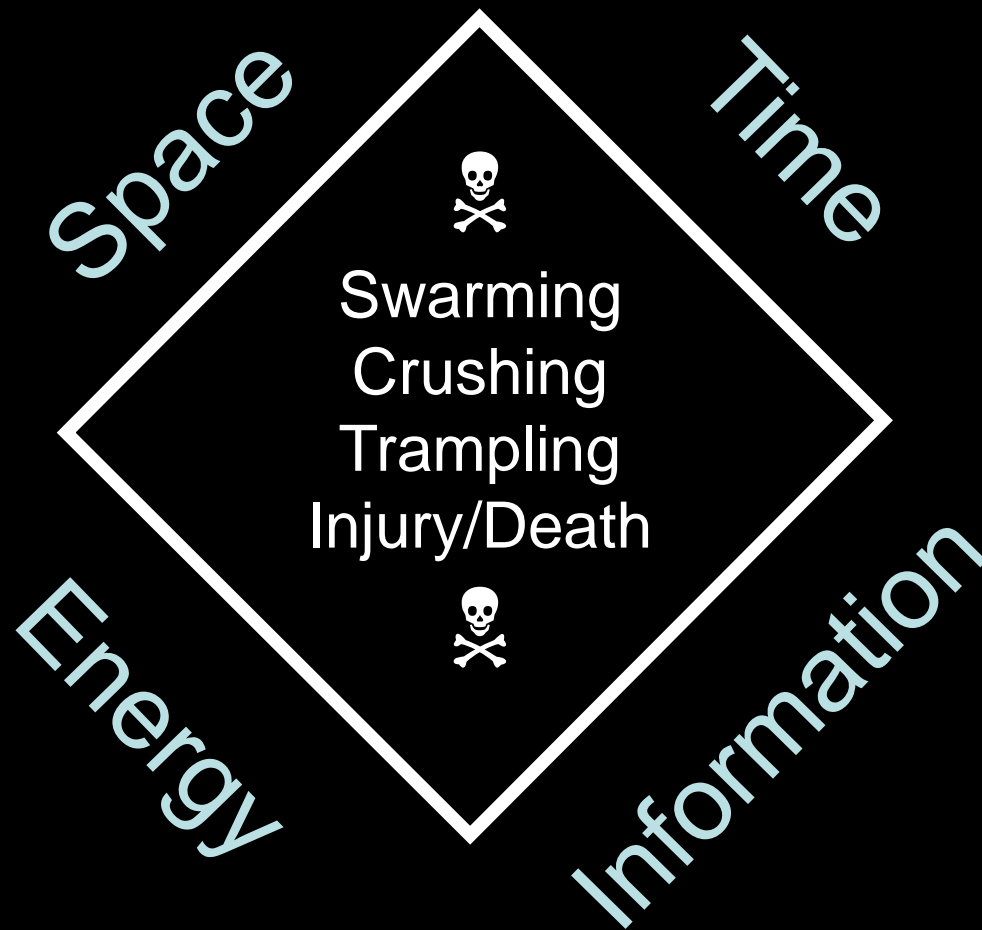
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The International Crowd Management Conference
Dallas/Ft. Worth, TX
November 8, 2011

Presentation Objectives

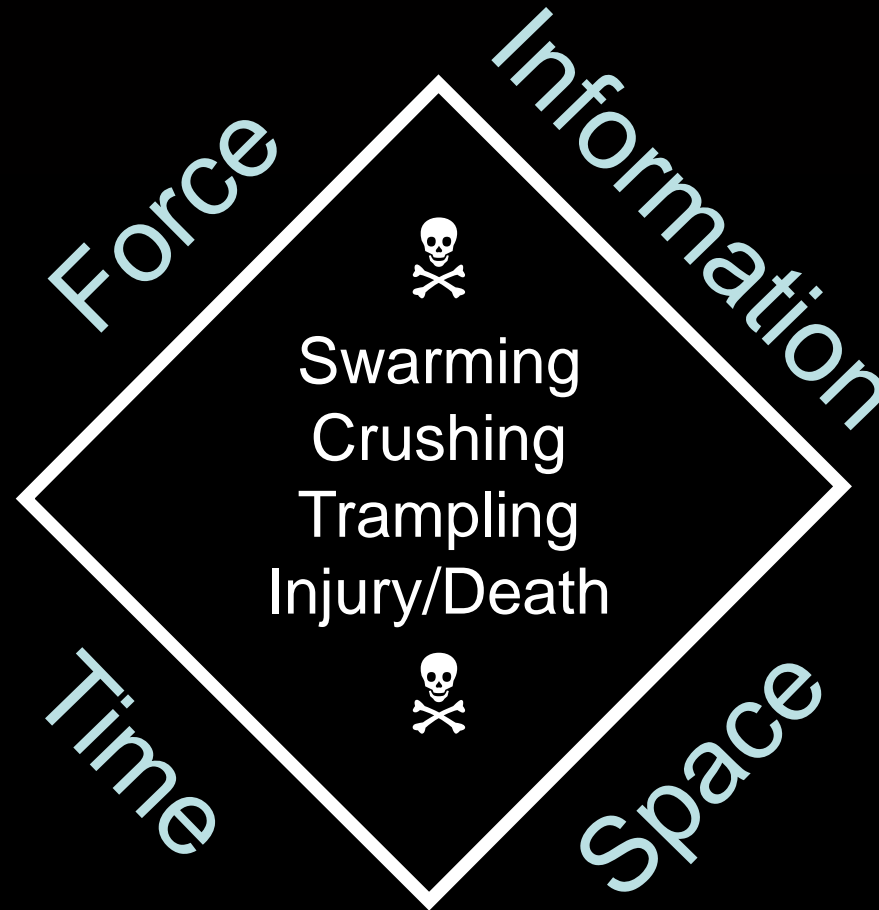
1. Review general crowd behavior principles
2. Present research findings
 - Identify most common crowd violence triggers
 - Relate findings to popular principles
3. Discuss strategies to neutralize triggers
4. Future directions

John Fruin (1985) – Chaotic and dangerous crowd movements



John Fruin (2002) – FIST Model

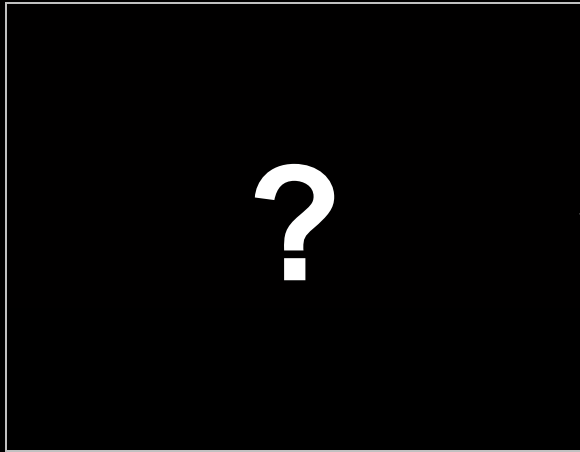
Chaotic and dangerous crowd movements



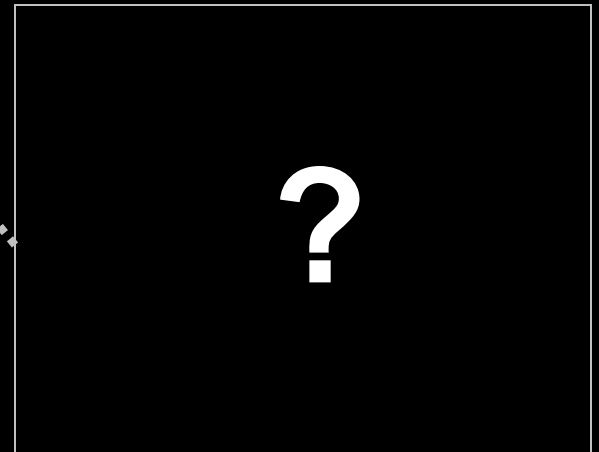
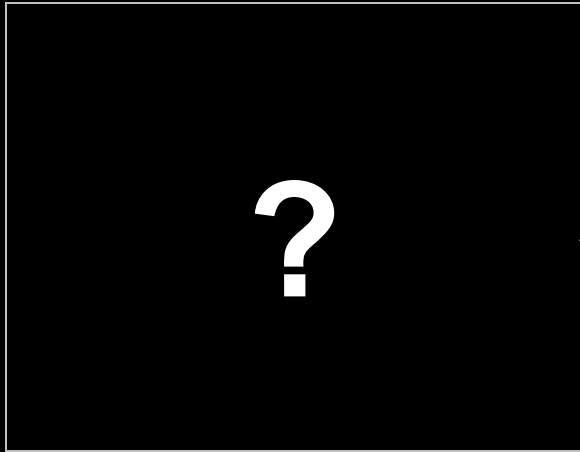
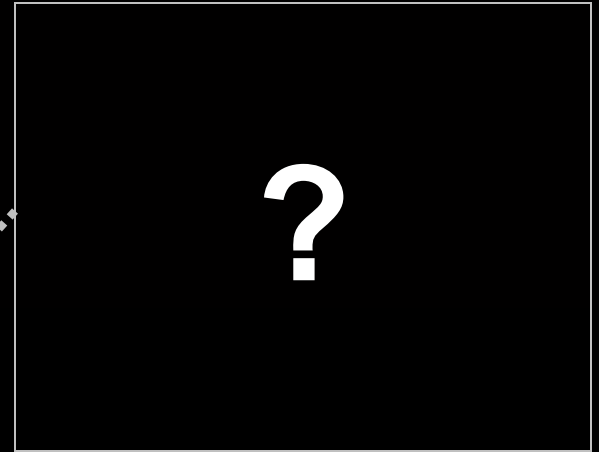
FIST Model of Crowd Disasters

Element	Explanation
<u>F</u>orce	Crowd pressure
<u>I</u>nformation	What is believed to be true
<u>S</u>pace	Physical design
<u>T</u>ime	Duration of event or incident

Force



Information



Time

Space

Force

*What you don't do can be a
destructive force*

~ Eleanor Roosevelt

Participant Decision-Making

Five Principles

1. Crowds consist of individuals
2. Individuals make independent decisions
3. People are goal driven
4. People function and move in groups
5. People react to their environment

Exit-Seeking Behaviors

- Low excitement (normal conditions)
 - Design-driven
- High excitement (panic)
 - Distance-driven
- If exit cannot be seen
 - Follow larger crowds

Density Impacts Force

- High density crowds – 5 per meter²
 - Trampling
 - Very high density crowds – 10 per meter²
 - Crushing
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Distribution of Risk

- Factors influencing tolerable force
 - High vs. Low Barriers
 - Age/Gender
 - Duration

Detecting Critical Density Levels

- High Densities Crowds
 - Fluid lines become stop and go waves
- Critical Crowd Conditions (> 10 per m^2)
 - Random movement in all directions
 - People no longer move voluntarily
 - “Crowd turbulence”

Who is in your venue?

- Highly identified fans
 - Experience weakened social restraints
Dimmock & Grove 2005
 - View verbal aggression as appropriate
Donahue & Wann 2009

- Demographics
 - Young, male, single
Russell 1995

- Peacemakers
 - Large stature, older, less impulsive, favor law and order
Russell & Arms 2001

Winners Take All...

- Winning = Higher levels of aggression = Greater alcohol consumption

Moore et al. 2007

- Assaults, stabbings, and shootings of women increase in Washington, D.C. when Washington Capitals NHL team wins

White et al. 1992

Case Study: Ten Cent Beer Night

Ten 10oz Beers for \$1

- June 4, 1974
- Cleveland Indians versus Texas Rangers
- Season high attendance: 25,134 fans
 - 65,000 beers consumed

Inappropriate Intervention

- Crowd manager actions interpreted as illegitimate will unite the crowd against them

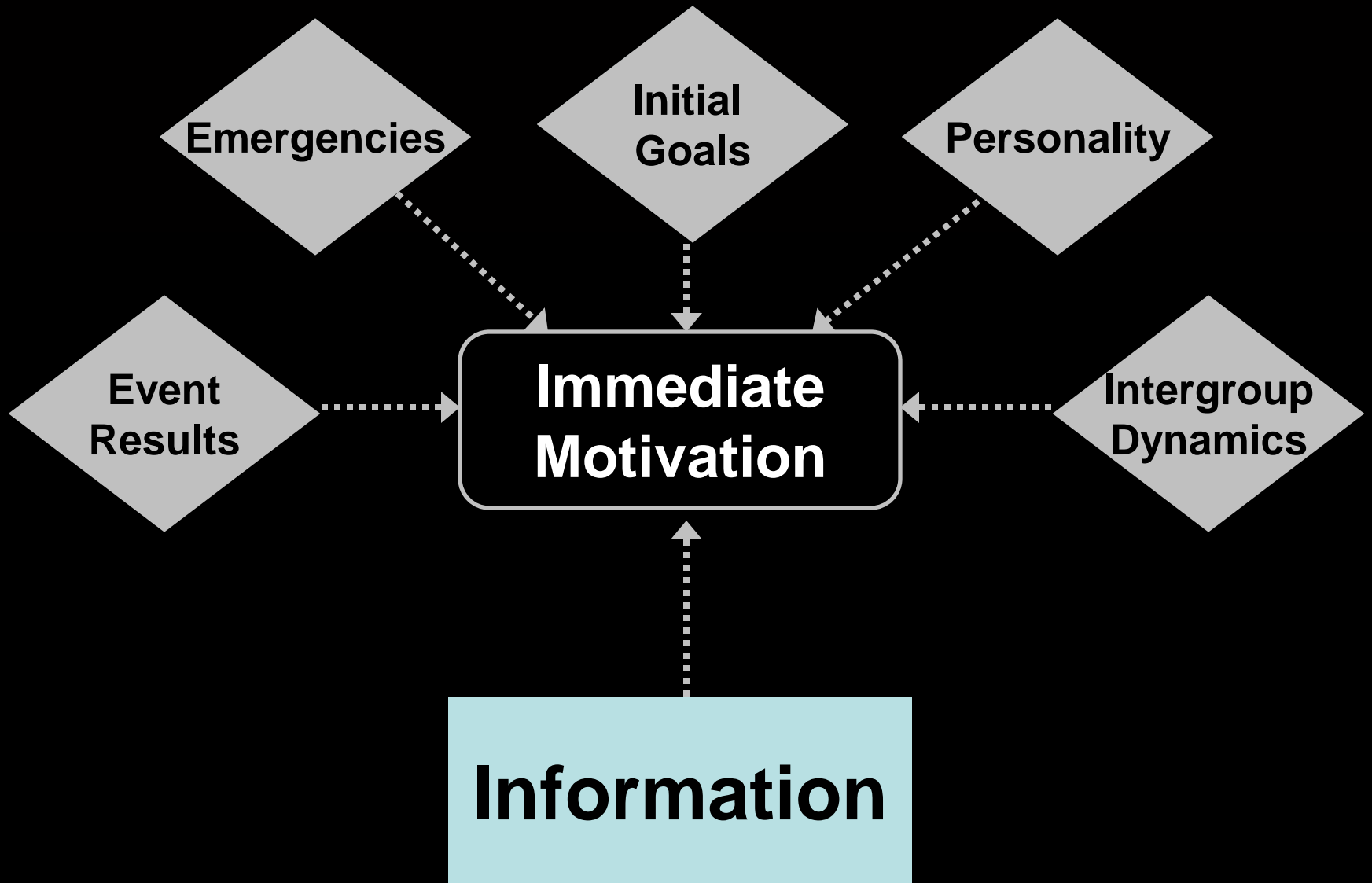
Drury & Reicher 2009

- Failure to immediately remove threats (i.e., violent individuals) allows negative behavior to influence the decision-making of others

Pattern & Arbolde-Florez 2004

Force

Motivation



Information

*Business today consists in
persuading crowds*

~T.S. Eliot

Visual Cues

- Crowd participants' behavior changes about 8 seconds away from a target

Paris et al. 2007

- Non-graded security strategies; View/use of “offensive” weapons (tear-gas, water cannons)

Frosdick 2005; Saari 2009

- Physical containment increases hostility

Bond 2009

Social Cues

- Treating crowds as homogenous entities will incite negative behavior

Drury & Reicher 2009

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- Non-personalized interactions
 - Misunderstanding intentions/purpose

White 2006; Sousa & Madensen, 2010

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- Stereotypes become a self-fulfilling prophecy

Spears et al. 2004

Group Norms

- Participants
 - Reactions from other group members
 - Feelings of anonymity permit aggressiveness
- Managers
 - Accountability (both external and internal) drives desires to intervene in harmful ways

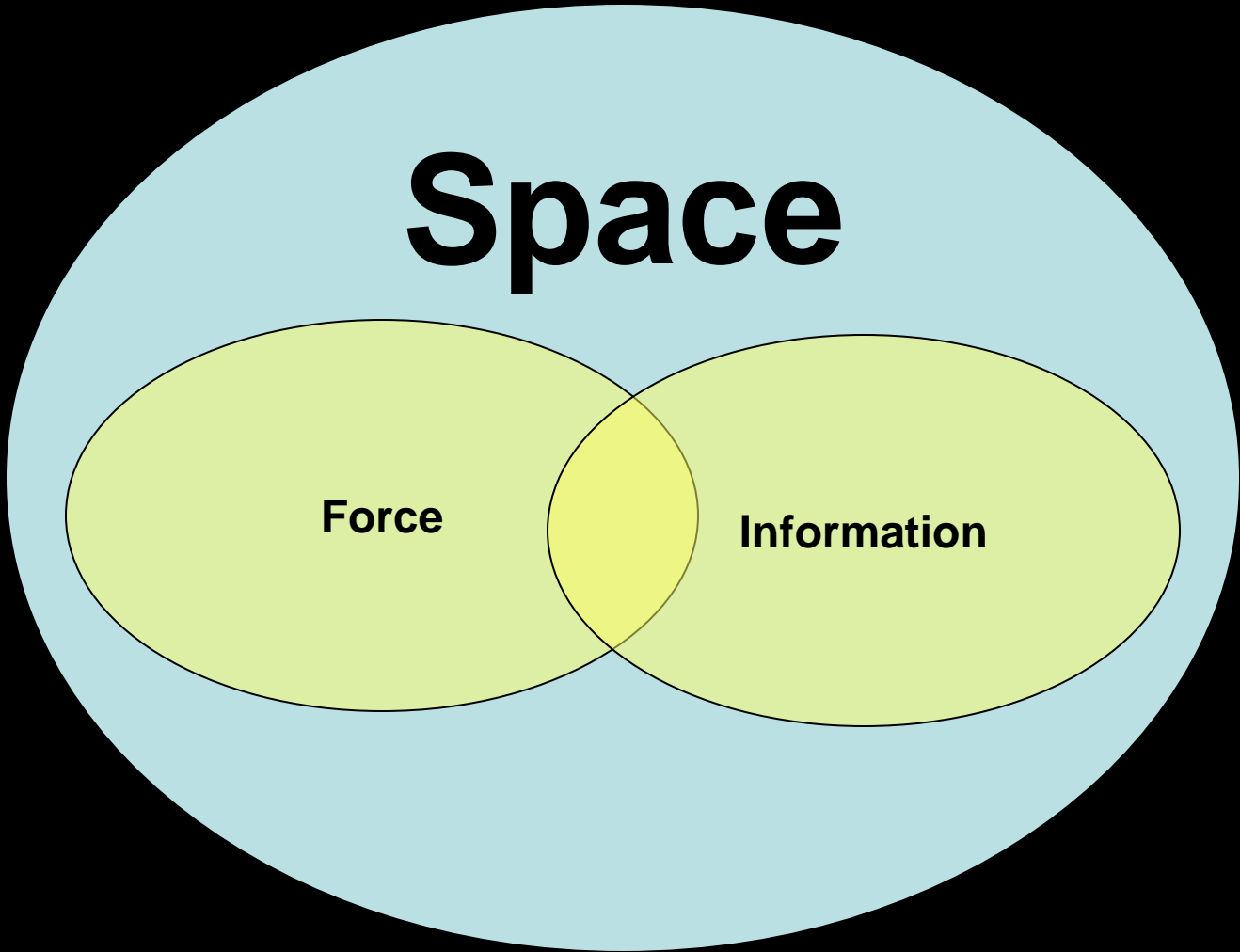
Cronin & Reicher 2006

Time

Space

Force

Information



Space

*When you give him space and
time, he's going to hurt you*

~Jacques Martin

Restrictions to Pedestrian Flow

- Bottlenecks Graat et al. 1999

- Columns/barriers Zhang et al. 2009

- Corners Lee & Hughes 2006

- Inadequate entry/exit points Mathias 1991

- Non-tapered theater seating Helbing et al. 2005

- Stairs Furin 2002

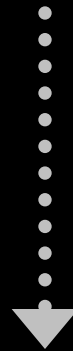
- Small passageways Zhang et al. 2007, 2009

- “Sticking” points Zhang et al. 2007

Other “Space” Design Elements

- Case Study: Hillsborough Stadium Disaster
 - How space is used impacts “force” and “information”
 - ...Open air toilets, food cooked and consumed in the open, no pre-match entertainment, no shelter from the elements, and standing on sloping concrete terraces...
 - ...All contributed to the lowering of self-esteem, responsibility, and the abandonment of social norms

Poorly designed spaces can create dangerous crowd densities



Directly impact the force element of the FIST model

Force

Physical

Crowd movement

Psychological

Personalities

Event outcomes

Intergroup dynamics

Motivation

Information

Communication

Visual Cues

Social Cues

Interpretations

Group norms

Participants

Managers

Crowd Violence Risk Factors "Triggers"



Duration of...

Negative Force

X

Misinformation

X

Unsafe Space

= **Violence**

Physical

Obstacles/barriers

Static design

elements

Conditions

Crowd Densities

Body zones

Time

Space

Violence is not random

Response

FIST – Separating Personalities

Family Zones



**Photo Courtesy of
Bethel Woods Center
for the Arts**

Response

FIST – Group Norms

Establishing Rules
Acceptable Behavior



NFL Club Fan Codes
of Conduct

*Seattle Seahawks

Miller 2010

Response

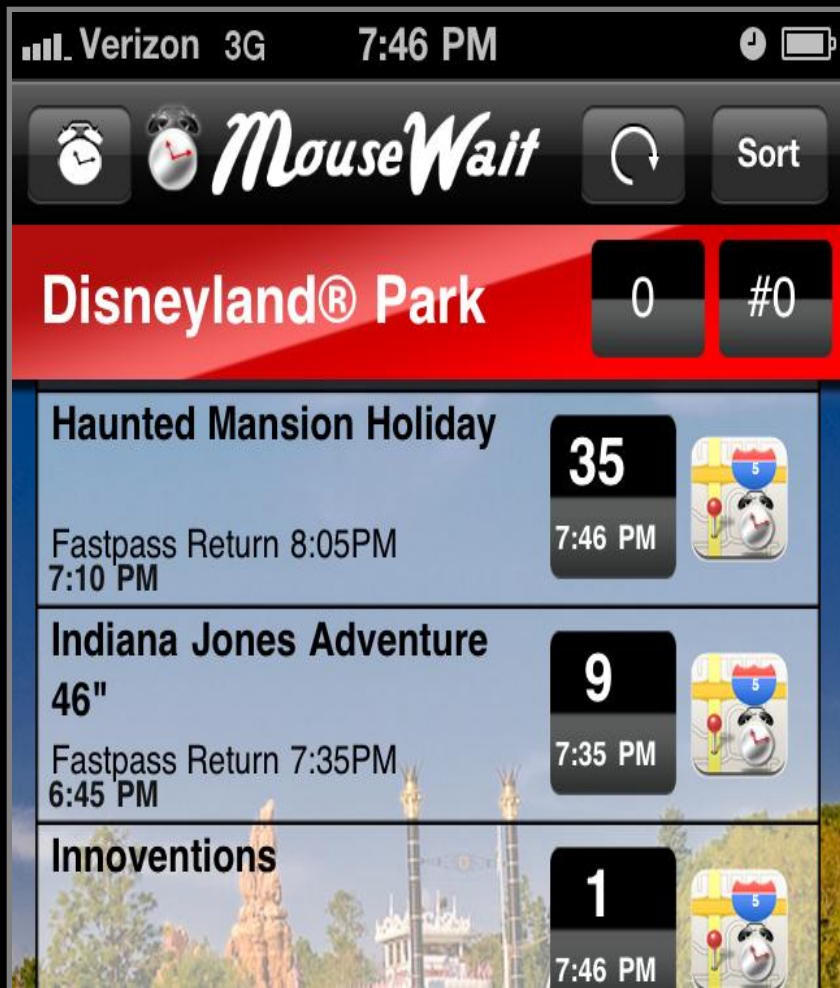
FIST – Group Norms

Facilitating Early Intervention



Response

FIST – Extreme Crowd Densities



Mini parade

“Move it! Shake it! Celebrate it!”

- Draws guests into less populated lands

Future Directions

Crowd Management Research Council

- Collect systematic information on strategies used in venues throughout the world
- Assess strategy/intervention effectiveness
- Distribute information among members



 **IAM** crowd.management
International Association of
Venue Managers, Inc.



Research Council Members

- No cost
- Asked for advice, interviews, information
- Help to coordinate visits (when possible)
- Sign-up! E-mail contact information to:

Tamara.Madensen@unlv.edu

(Name, Title, Affiliation, Address, E-mail, Phone)