

Problem Behavior: from Treatment to Prevention

B. A. Iwata
University of Florida

Main Points

- ❖ Historical changes in the field
- ❖ Treatment → Prevention?
- ❖ Medical model of prevention
- ❖ Predictors of problem behavior
- ❖ General prevention strategies
- ❖ Specific examples of prevention

Problem Behavior: Pre-JABA Research

- ❖ Psychiatric nurse as a behavioral engineer
(Ayllon & Michael, JEAB, 1959)
- ❖ Operant conditioning & problem behavior in autism
(Wolf, Ritsley, & Mees, BR&T, 1963)
- ❖ Extinction of problem behavior of mental patients
(Holz, Azrin, & Ayllon, JEAB, 1963)
- ❖ Treatment of SIB in childhood schizophrenia
(Lovaas, Frietag, Gold, & Kassorla, JECP, 1965)

Early Research

- ❖ **Emphasis**
 - ❖ Assessment: Establishment of baseline
 - ❖ Treatment: Extension of learning principles
 - ❖ Outcome: Elimination of problem behavior
- ❖ **Prevention not a concern**
 - ❖ No "problem" to solve
 - ❖ No basis for prediction
 - ❖ No prevention technology
 - ❖ Some early studies not recognized as prevention

Contemporary Research

- ❖ **Emphasis**
 - ❖ Assessment: Identification of environmental determinants (aka functional analysis)
 - ❖ Treatment: Matched to function of behavior
 - ❖ Outcome: Replacement of problem behavior
- ❖ **By products**
 - ❖ Functional analysis → reinforcement contingencies
 - ❖ Establishing operations (EOs) → Determinants of reinforcer value?
 - ❖ Elimination of EOs or contingencies → **prevention?**

Disease Prevention

(JCCD, 1957 → Gordon, 1987)

	<u>Target</u>	<u>Characteristic</u>
<u>Universal</u>	General population	Not identified at risk
<u>Selective</u>	Individuals	Higher than average risk
<u>Indicated</u>	Individuals	Early symptoms

Examples

	<u>Characteristic</u>	<u>Focus</u>
<u>Universal</u>	No Risk	Diet & Exercise BP Screening
<u>Selective</u>	Moderate Risk	Treatment of Obesity
<u>Indicated</u>	Early Symptoms	Treatment of Hypertension

Key Concept in Prevention

RISK

Prevention of Chronic Disease

- ❖ Risk factor identification
 - ❖ Comparative studies: Diseased vs. healthy
 - ❖ Correlational studies: Factors predictive of disease
 - ❖ *Experimental studies: Causes of disease
- ❖ Risk factor reduction
 - ❖ Universal: Aimed at population
 - ❖ Selective & Indicated: Aimed at individuals

Risk Factors for Disease

Definition: Personal characteristic correlated with increased probability of disease

- ❖ Biological condition
 - ❖ Inherited
 - ❖ Acquired
- ❖ Environmental circumstance
 - ❖ Living condition
 - ❖ Working condition
- ❖ Behavior
 - ❖ Excess
 - ❖ Deficit

Risk Factor Reduction

- ❖ Universal (managerial) risk factor reduction
 - ❖ Environmental modification: Water fluoridation
 - ❖ Legislation: Seat belt laws
 - ❖ Public education: Benefits of BP screening
- ❖ Selective/indicated (personal) risk factor reduction
 - ❖ Instruction & counseling: Lifestyle modification
 - ❖ Motivation: **Aha . . . contingencies**

Risk Factors for Problem Behavior

- ❖ Traditional Comparative & Correlational Research
 - ❖ Severity of ID (Schroeder et al. 1978)
 - ❖ Communication deficit (Ando & Yoshimura, 1979)
 - ❖ Sensory & physical impairment (Guess & Carr, 1991)
- ❖ But . . . Correlates are not the same as causes
 - ❖ ID, communication deficit, sensory deficit do not produce problem behavior

Experimental Research: Attention Deprivation

- ❖ *EO influence*
 - ❖ *Increases the value of attention as a reinforcer*
 - ❖ *Produces behavior maintained by attention*
- ❖ *Combine with*
 - ❖ *Limited communication skills*
- ❖ *Combine with*
 - ❖ *Differential consequences for problem behavior*
- ❖ *Result*
 - ❖ *Attention deprivation → problem behavior → attention*

Experimental Research: Aversive Stimulation

- ❖ *EO influence*
 - ❖ *Increases the value of escape as a reinforcer*
 - ❖ *Produces behavior maintained by escape*
- ❖ *Combine with*
 - ❖ *Limited communication skills*
 - ❖ *Limited capacity for compliance*
- ❖ *Combine with*
 - ❖ *Differential consequences for problem behavior*
- ❖ *Result*
 - ❖ *Aversive stimulation → problem behavior → escape*

Experimental Research: Sensory Deprivation

- ❖ *EO influence*
 - ❖ *Increases the value of sensory stimulation*
 - ❖ *Produces behavior results in sensory stimulation*
- ❖ *Combine with*
 - ❖ *Limited self-stimulatory repertoire*
- ❖ *Result*
 - ❖ *Sensory deprivation → problem behavior → sensory stimulation*

Risk Factors for Problem Behavior

- ❖ *Environmental EOs*
 - ❖ *Social deprivation → Social Sr+ (attention) valuable*
 - ❖ *Social demands → Social Sr- (escape) valuable*
 - ❖ *Sensory deprivation → Sensory Sr (automatic) valuable*
- ❖ *Response Deficits*
 - ❖ *Communication → No control over social environment*
 - ❖ *Compliance → Inability to engage in target response*
 - ❖ *Leisure → Limited self-stimulatory repertoire*
- ❖ *Contingency Deficits*
 - ❖ *Ineffective instruction*
 - ❖ *Limited reinforcement for appropriate behavior*
 - ❖ *Reinforcement for problem behavior*

Prevention of Problem Behavior

- ❖ *Prevention vs. treatment?*
 - ❖ *Treatment: Intervention to decrease problem behavior*
 - ❖ *Prevention: Intervention prior to a "complaint"*
- ❖ *Prevention vs. acquisition of adaptive behavior?*
 - ❖ *Acquisition: Behavior improves general functioning*
 - ❖ *Prevention: Behavior protects against risk factor*

EOs Predictive of Problem Behavior

- ❖ *Social deprivation*
 - ❖ *PB maintained by social Sr+*
- ❖ *Social (task) demands*
 - ❖ *PB maintained by social Sr-*
- ❖ *Sensory deprivation*
 - ❖ *PB maintained by automatic Sr*

Amelioration of EOs

- ❖ **Social deprivation**
 - ❖ Noncontingent (scheduled) attention (Vollmer et al., 1993)
 - ❖ Alt Sr+ during periods of deprivation (Fisher et al., 2000)
- ❖ **Social demand**
 - ❖ Noncontingent breaks from work (Waller & Higbee, 2010)
 - ❖ Demand fading (Pace et al., 1994)
 - ❖ Hi-P instructional sequence (Mace & Belfiore, 1990)
 - ❖ Noncontingent Sr+ during tasks periods (Kodak et al., 2003)
- ❖ **Sensory deprivation**
 - ❖ Noncontingent access to leisure items (Ringdahl et al., 1997)

Response Deficits Predictive of Problem Behavior

- ❖ **Communication repertoire**
 - ❖ Mands for Sr+
 - ❖ Ands for Sr-
- ❖ **Compliance repertoire**
 - ❖ Limited imitation (motor, vocal) skills
 - ❖ Limited instruction following
- ❖ **Leisure (toy play) repertoire**
 - ❖ Limited play skills

Amelioration of Response Deficits

- ❖ **Communication (mands)**
 - ❖ Social deprivation → “Attention please”
 - ❖ Social demand → “Break please”
 - ❖ Both described as DRA or FCT (Carr & Durand, 1985)
- ❖ **Compliance repertoire**
 - ❖ Imitation, motor and vocal (Garcia et al., 1971)
 - ❖ Instruction following (Striefel et al., 1974)
- ❖ **Leisure repertoire**
 - ❖ Object manipulation and play skills (Lindberg et al, 1999)

Amelioration of Contingency Deficits

- ❖ **Ineffective instruction**
- ❖ **Limited reinforcement for appropriate behavior**
- ❖ **Inadvertent reinforcement for problem behavior**
 - ❖ Solution to all: Parent/caregiver training + feedback

Selective Risk Factors for Problem Behavior

Risk factor identification → Sensitivity tests

- ❖ Identify EOs that may occasion PB
- ❖ Present EO in a controlled series of trials
- ❖ Record response as appropriate or inappropriate
- ❖ Predictive of problem behavior?

Risk factor intervention → Sensitivity test flunked

- ❖ Baseline measure
- ❖ Training: Instructions, modeling, contingencies
- ❖ Post-treatment and generalization measures
- ❖ Evidence of prevention?

Tests for PB Maintained by Sr+

- ❖ **Access to attention**
 - ❖ Delayed access: “Not now; I’m busy”
 - ❖ Removal of attention: “I have work to do now”
- ❖ **Access to tangible items**
 - ❖ Removal of tangible: “Sorry, you can’t have that”
 - ❖ Termination of activity: “Playtime is over”
 - ❖ Sharing: “It’s my turn”

Tests for PB Maintained by Sr-

- ❖ *Initiation of nonpreferred activity*
 - ❖ *Task demand: "Time to work now"*
 - ❖ *Social request: "Tell me what you're doing"*
- ❖ *Other sources of social provocation*
 - ❖ *Prolonged staring*
 - ❖ *Threatening gesture*
 - ❖ *Annoying sound or movement*
 - ❖ *Verbal insult*

Tests for PB Maintained by Automatic Sr

- ❖ *Deprived environment*
 - ❖ *Alone*
 - ❖ *Alone plus toys*

Miscellaneous Tests

- ❖ *Lying*
 - ❖ *Say → do correspondence: "I'll do my homework"*
 - ❖ *Do → say correspondence: "I did my homework"*
 - ❖ *Avoidance of blame: "I didn't break that"*
 - ❖ *And a host of others*

Example: Delayed Access to Attention ("Loneliness" Training)

- ❖ *Test*
 - ❖ *Stand nearby but ignore*
 - ❖ *Mand for attention → "I'm busy right now"*
 - ❖ *Observe reaction*
- ❖ *Delay training*
 - ❖ *Mand for attention → Immediate, brief attention*
 - ❖ *Progressive delay to attention*
 - ❖ *EXT of problem behavior*

Example: Delayed Access to Tangible ("Disappointment" Training)

- ❖ *Test*
 - ❖ *Make HP tangible visible but unavailable*
 - ❖ *Mand for HP tangible → "Not now, maybe later"*
 - ❖ *Observe reaction*
- ❖ *Delay training*
 - ❖ *Mand → Immediate, brief access to tangible*
 - ❖ *Progressive delay to access*
 - ❖ *EXT of problem behavior*
- ❖ *Alternative access training*
 - ❖ *Mand → "X is unavailable, but you can have Y"*
 - ❖ *EXT of problem behavior*

Example: Task Initiation ("Compliance" Training)

- ❖ *Test*
 - ❖ *Approach and say, "It's time to work"*
 - ❖ *Observe reaction*
- ❖ *Compliance Training*
 - ❖ *Prompt and reinforce simple, brief imitation of fun activities*
 - ❖ *Correction of errors*
 - ❖ *EXT of problem behavior*
 - ❖ *Gradual exposure to increased work requirement*

Example: Response to Provocative Statement ("Turn-the-other cheek" Training)

- ❖ **Test**
 - ❖ Approach and say, "That's an ugly shirt"
 - ❖ Observe reaction
- ❖ **Desensitization training**
 - ❖ Role play w/ mild provocative statements
 - ❖ Teach appropriate Alt R (walk away, tell teacher)
 - ❖ Correction of problem behavior
 - ❖ Gradual exposure to increasingly provocative stimuli

Some Early Studies

- ❖ **Risk factor identification**
 - ❖ Delay of gratification (Mischel & Ebbeson, 1970)
 - ❖ Resistance to temptation (Kanfer & Zich, 1974)
 - ❖ Insularity (Wahler, 1980)
 - ❖ Predictors of SIB (Oliver et al., 2001)
 - ❖ Proto-injurious behavior (Richman & Lindauer, 2005)

Some Early Studies

- ❖ **Risk factor protection**
 - ❖ Recruitment of attention (Graubard et al., 1971)
 - ❖ Sharing (Barton & Ascione, 1979)
 - ❖ Social vs. solitary play (Wahler & Fox, 1980)
 - ❖ Dining with children (Bauman et al., 1983)

A Nice Model of Universal Prevention

(Hanley et al., 2007)

- ❖ **N=16, preschool setting**
- ❖ **Assessment:**
 - ❖ 13 "prosocial" skills identified
 - ❖ Evocative events defined (occasions for skills)
 - ❖ Periodic **individual** probes in classroom
- ❖ **Treatment**
 - ❖ Group instruction – description, modeling, practice
- ❖ **Evidence of prevention?**

Thirteen Prosocial Skills

(Hanley et al, 2007)

1. Respond to name
2. Comply with single instruction
3. Comply with multiple instruction
4. Request help
5. Request attention
6. Framed request to adult: "Excuse me, . . ."
7. Framed request to peer
8. Tolerance of delay imposed by adult
9. Tolerance of delay imposed by peer
10. Saying "Thank you"
11. Acknowledge or complement other
12. Offer to share
13. Comfort other: "Are you OK?"

A Nice Model of Universal Prevention

(Hanley et al., 2007)

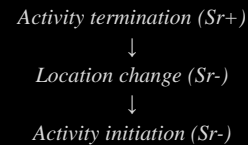
- ❖ **N=16, preschool setting**
- ❖ **Assessment:**
 - ❖ 13 "prosocial" skills identified
 - ❖ Evocative events defined (occasions for skills)
 - ❖ Periodic **individual** probes in classroom
- ❖ **Treatment**
 - ❖ Skills divided into 4 units (2-4 skills each)
 - ❖ Group training during circle time
 - ❖ Instruction, modeling, role play, feedback
 - ❖ All Ss showed improvement
- ❖ **Evidence of prevention?**

A Case Study of Selective Prevention (Mace et al., 2011)

- ❖ $N=1$, 13 yoa, autism, residential school
- ❖ Context:
 - Refusal of request for access to computer game
- ❖ Treatment
 - No + explanation: "I'm sorry, you can't play now"
 - No + alt activity: Offer to play football for 5 min
 - Yes + contingency: Yes after 10-min school work
- ❖ Results
 - PB decreased under alt activity and contingency
 - **BUT** treatment due to EXT?

A Common Predictor of Problem Behavior

Components of a "transition"



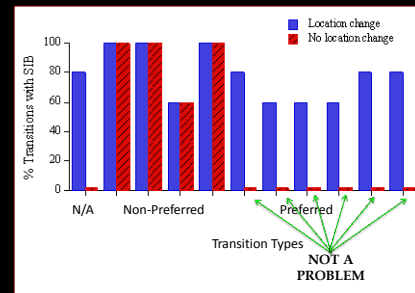
38

Functional Analysis & Treatment of Self-Injury Associated with Transitions (McCord, Thomson, & Iwata, 2001)

- ❖ $N=2$, ID, SIB (reportedly during transitions)
- ❖ Functional analysis
 - ❖ Activity assessment
 - + Preferred
 - + Non-preferred
 - ❖ Transition trials
 - + Activity presentation
 - + Activity termination
 - + Location change

39

Functional Analysis Results: Michael



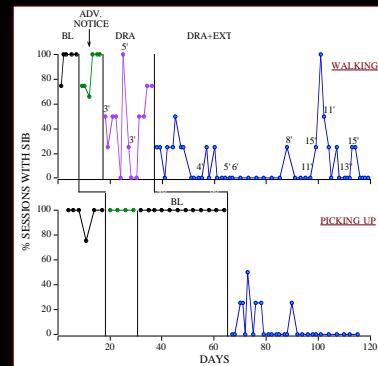
40

Treatment Procedures

- ❖ Treatment contexts:
 - Location change (walk 15 ft)
 - Task initiation (pick up)
- ❖ Phase 1: Advance notice (no EXT)
 - Prompt delivered 2 min prior to transition
 - Compliance → No consequence
 - SIB → Transition terminated
- ❖ Phase 2: DRA (no EXT)
 - Compliance → edible
 - SIB → Transition terminated
- ❖ Phase 3: DRA + EXT
 - Compliance → edible
 - SIB → Transition continued (no escape)

41

Treatment Results: Michael



42

Potential Functions of Advance Notice (AN)

Scenario #1

- ✦ Transition → Unpredictable event (type irrelevant)
- ✦ Cue (information) → Transition
- ✦ AN = **Predictability cue, unrelated to any consequences**

Scenario #2

- ✦ Transition → Compliance vs. noncompliance
- ✦ Cue → Transition → Compliance → Sr+
- ✦ AN: Cue correlated with reinforced response
- ✦ AN = **Discriminative stimulus (S^D) for compliance**

Scenario #3

- ✦ Transition → Problem behavior
- ✦ Cue → Life gets worse
- ✦ AN: Cue correlated with worsening
- ✦ AN = **Establishing operation (EO) for escape**

43

Effects of Advance Notice on Behavior in Transition

J. M. Harper, B. A. Iwata, & K. G. Horton

University of Florida

44

General Method

- ✦ Subjects: N=6, diagnosed with autism and ID
- ✦ Setting: Special education school
- ✦ General Sequence:
 - ✦ Activity Assessments
 - ✦ Study 1: Noncompliance
 - ✦ Study 2: Escape

45

Activity Assessments

- ✦ Preferred
 - ✦ Multiple stimulus (Deleon et al., 1996)
 - ✦ Selection → 30-s access
 - ✦ High preference (HP): Selected on ≥ 75% trials
- ✦ Nonpreferred
 - ✦ Paired stimulus (Fisher et al., 1996)
 - ✦ Chair 1 → task; Chair 2 → no task
 - ✦ Selection → 30-s access
 - ✦ Low Preference (LP): 5 consecutive no-task choices

46

Transition Trials (both studies)

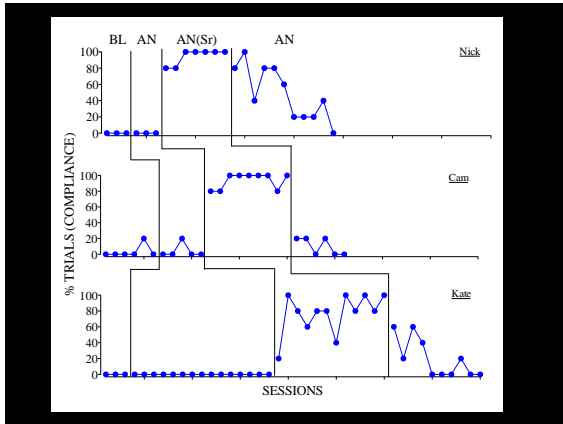
- ✦ Session: 5 transition trials
 - ✦ 2 min pre-transition: HP activity available
 - ✦ Transition: "Time to work" and present LP task
 - ✦ 2 min post-transition: LP task available
- ✦ DVs
 - ✦ Studies 1 and 2: % trials compliance (10 s of prompt)
 - ✦ Study 2 only: % trials escape

47

Study 1: Experimental Conditions

- ✦ Baseline (BL)
 - ✦ Compliance → No consequence
 - ✦ Noncompliance → No consequence
- ✦ Advance notice (AN)
 - ✦ AN prompt: "In 2 min, it is time to work"
- ✦ AN plus Sr+
 - ✦ AN prompt
 - ✦ Compliance → Edible
- ✦ AN: Same as previous AN

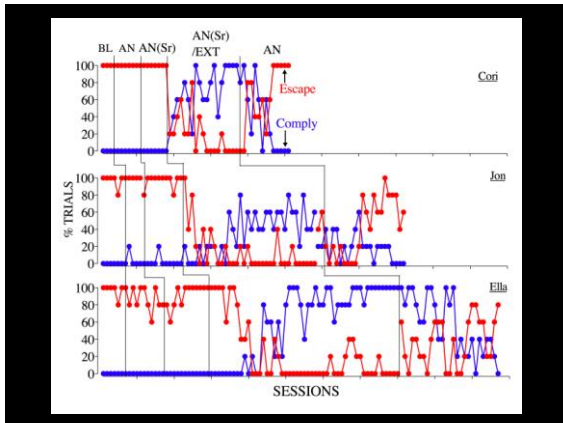
48



Study 2: Experimental Conditions

- ❖ Pre-training
 - ❖ Button press (escape R) → Terminate trial
- ❖ Baseline (BL)
 - ❖ Compliance → No consequence
 - ❖ Noncompliance → Prompt sequence
 - ❖ Button press (escape R) → Terminate trial
- ❖ Advance notice (AN)
 - ❖ AN prompt: "In 2 min, it is time to work"
- ❖ AN plus Sr+
 - ❖ AN prompt, Compliance → Edible
- ❖ AN plus Sr+ plus EXT
 - ❖ AN prompt, Compliance → Edible, Escape → prompt
- ❖ AN: Same as previous AN

50



Conclusions about Advance Notice

- ❖ AN as predictability cue
 - ❖ Perhaps, but no facilitative effect (Study 1)
 - ❖ Detrimental effect (Study 2)
- ❖ AN as S^D for compliance
 - ❖ Dependent on correlation with reinforcement
 - ❖ Effective if compliance is sole target (Study 1)
 - ❖ Ineffective if transition produces escape (Study 2)
- ❖ AN as EO for escape
 - ❖ Yes when escape behavior available
 - ❖ PB may occur after AN but PRIOR to task (avoidance)

52

The Methodological Problem: PREDICTION

- ❖ Does a selective risk factor predict PB?
 - ❖ Discrimination test: PB vs no PB Ss
 - ❖ Prediction test: Does PB emerge?
- ❖ What is the criterion for prevention?
 - ❖ Passing test is not evidence of prevention
 - ❖ Between-S: Longitudinal data on E vs. C groups
 - ❖ Within-S: Longitudinal data on Target vs. control R

Some Suggestions for Research

- ❖ Risk factor identification
 - ❖ Efficient tests for selective risk factors
 - ❖ Methodology for predictive power
- ❖ Risk factor reduction
 - ❖ Development of risk-factor interventions
 - ❖ Packaging for efficient delivery
 - ❖ Demonstration of preventive utility

General Implications for Prevention

- ❖ *Prevention in the short run*
 - ❖ *Eliminate or minimize EOs*
- ❖ *Intermediate prevention*
 - ❖ *Establish responses protective against EOs*
- ❖ *Prevention in the long run*
 - ❖ *Systematic exposure to everyday EOs **required***
 - ❖ *Training programs to tolerate EOs*

What about Contingency Deficits?

- ❖ *Teacher training programs should include ABA component*
- ❖ *School Psychology training programs should include FA component and equivalent of BCBA*
- ❖ *Parent training programs . . .*