MICHIGAN STATE UNIVERSITY

Considering Dosage in After-School Programs: Linking Activity Types to Outcomes

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Purpose of the Presentation

- Discuss different ways of defining dosage
- Demonstrate examples of different relationships that occur between specific definitions of dosage and other measures

Defining Dosage

- Links between program participation and outcomes have been limited by the use of global measures of program dosage (Weiss, Little, & Bouffard, 2005).
- Historically, participation has been defined as binary—attended or did not attend
- Movement toward continuous dosage measures

Defining Dosage

- Chaput, Little, & Weiss (2005) framework:
  - Any time (yes/no)
  - Intensity: Amount of time youth attend the program within a time period
    - Hours per day
    - Days per week
    - Weeks per year
  - Duration: Time from start to finish or cut-off
    - Number of years
    - Number of days
  - Breadth: Variety of activities youth participate in within and/or across programs
- 21st CCLC: Regular (30 days or more)

Linking Dosage to Outcomes

- An additional dimension: tying the activity dosage to the expected outcome when multiple activity types are implemented
- How does dosage for, say, academic activities, relate to academic outcomes versus dosage for other types of activities?
- **So, calculate dosage for specific activity types, and consider what each dosage definition *means***

Program Overview

- Evaluation of 21st Century Community Learning Centers (21st CCLC) after-school programs in Michigan
- Funded by MI Dept of Education through U.S. Dept of Education
- 32 organizations, 193 sites (range = 1 to 16 sites)
  - Mostly school districts
  - A few community-based organizations and intermediate school districts
- Goals: Increase academic achievement and general functioning for students in low-performing schools in high-poverty areas

Attendance Data

- Online attendance tracking system
- Attendance kept by student, date, activity, minutes, and type

Student	Date	Activity	Minutes	Type
1001	10/27/07	Homework help	60	AC_HW
1001	10/27/07	Basketball	45	REC
1001	10/28/07	Legos	60	AC_ENRICH
1001	10/28/07	Character ed	90	YD
1050	10/27/07	Basketball	45	REC

Potential Dosage Definitions

Definition	This study
Attended at all	No
Intensity	
Number of days, hours in a year	
Overall	Yes
By activity type	Yes
"Regular attendance" (30 days or more)	Yes
Duration	
Overall	Yes
By activity type	Yes
Breadth	
Number of years	No
Number of activity types	Yes
Proportion of time spent in one activity type	Yes

Method

- Dependent measures
  - Change in teacher ratings of classroom behavior, homework completion, classroom participation (N = 2615 students, 97 sites)
  - Student program satisfaction (N = 2,550 students, 97 sites)
- Two types of activity categories:
  - **Overall:** Academic only, Nonacademic only, mixed
  - **Specific:** Academic enrichment, homework help/tutoring, arts, recreation, youth development, technology
- Hierarchical linear modeling to control for site differences
  - Controlling for student grade level, sex, race (and overall attendance when testing activity types), and number of days that site operated

Dosage Related to Teacher Ratings--Global

Definition	Effect size *r*
Intensity	
Days	**.39*** **
Hours	**.33*** **
Duration	**.23***
Breadth	-.14

- Teachers reported greater improvement among students who attended more intensely
- Number of days appears to be the strongest measure
- Breadth did not relate to teacher ratings

Dosage Related to Teacher Ratings—Overall Activity Types

	Effect size *r*		
Definition	**Hours**	**Duration**	**Proportion**
Academics only	-.01	.07	-.01
Non-academics only	.00	-05	-.11
Mixed (academics and non-academics)	.05	-.02	.09

- Overall categories were unrelated to teacher ratings

Dosage Related to Teacher Ratings—Specific Activity Types

	Effect Size *r*		
Definition	**Hours**	**Duration**	**Proportion**
Academic enrichment	**.20***	.12	**-.22***
Homework help/tutoring	-.08	-.07	-.07
Arts	**.26****	**.17t**	**-.29****
Recreation	-.09	.00	-.13
Youth development	.00	.00	**.17t**
Technology	.10	.06	-.16

- Hours of academic enrichment and arts activities were related to teacher ratings of improvement
- Duration was unrelated
- Proportions of academic enrichment and arts were negatively related, perhaps suggesting need for balance among activities

Dosage Related to Program Satisfaction--Global

Definition	Effect size *r*
Intensity	
Days	**-.21***
Hours	**-.17[t]**
Regular attendance (30 days or more)	**-.21***
Duration	**-.31****
Breadth	.11

- Intensity was related to *less* program satisfaction among students; the more they were there, the less happy they were

Dosage Related to Program Satisfaction—Overall Activity Types

	Effect size *r*		
Definition	**Hours**	**Duration**	**Proportion**
Academics only	.06	.05	.13
Non-academics only	**.19[t]**	.13	.16
Mixed (academics and non-academics)	.16	.10	.09

- Again, overall activity types were not particularly useful.

Dosage Related to Program Satisfaction—Specific Activity Types

	Effect Size *r*		
Definition	**Hours**	**Duration**	**Proportion**
Academic enrichment	-.05	.05	.08
Homework help/tutoring	-.02	**-.23***	**-.44*****
Arts	.15	.16	.07
Recreation	.11	.03	**-.37*****
Youth development	**.17t**	**.25****	.10
Technology	.07	.01	.07

- For students' perceptions, the *proportion* of activities they participate in is associated with their perceptions of the program; more homework, more recreation, the less they liked it

Students who participated in more youth development over time felt more positively about the program

Implications

- Consider a variety of dosage definitions and think about what they will mean for the outcomes
- Total days, hours works well as a proxy when necessary
- When possible, identify dosage for different activity types in order to test links between programming components and their intended outcomes
- Interaction effects may reveal more powerful prediction (e.g., days x duration)
- Site-level characteristics constrain the kind of dosage that students within a site can have