

## ENVIRONMENT/BEHAVIOR OBSERVATION SCHEDULE FOR EARLY CHILDHOOD ENVIRONMENTS

1. Instructions for Use
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3. Environment/Behavior Observation Schedule
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Observational measurement instruments have been developed for a range of dependent variables of interest in the study of the role of the socio-physical environment of child care centers on developmentally oriented behavior, and are included below. Types of dependent variables include task versus transition time, random or idle behavior, degree of engagement in developmentally appropriate activities, child-initiated activity versus staff-directed activity, exploratory behavior, types of social interactions among children, cooperative versus competitive behavior, teacher involvement versus passive watching, and teacher-teacher interactions. In developing the below instrument, the child development, early childhood education, and child-environment literatures were searched for the most appropriate and most reliable existing measures, with an eye to using existing measures if possible, adapting them, or, as a last resort, developing a new instrument.

Many observational schedules have been used in the literature, but none was found (at least up to 1982, when this instrument was first developed) that covered the above range of behaviors. For example, several observation schedules have been developed by others for observing and recording attention span in classroom settings (all references given in Moore, 1982). Another records active engagement versus disordered behavior. Still others are useful only for teacher-child interactions, or other single behaviors. Many other studies in the literature, because of using experimental designs, measure these behaviors through pre-determined games or puzzles, a situation not applicable to a naturalistic field setting such as is favored in most environmental psychology, environment-behavior, and child-environment research. For example, the Madsen Cooperation Board is not appropriate for field settings as it involves a staged situation where children must complete a specified task under controlled conditions. On the other hand, the structured observation procedures used by other investigators, where they record a number of well-defined behaviors while children are involved in a tower building task, or other similar tasks, is instructive for field studies as they are based on activities more like ordinary events in a child care center. Similarly, other observations schedules, consisting of scales organized into categories of behavior emitted by teachers is suggestive of possible measures of types of teacher involvement. The closest

observational schedule able to be found up to 1982 for the measurement of everyday behaviors in child care centers in relation to features of the socio-physical environment are those developed by Harms and Clifford (1980 ff.), Perkins (1980), and Kritchevsky, Prescott, and Walling (1972).

Based on review of all of the above observational schedules, a new Environment-Behavior Observation Schedule for Early Childhood Environments was constructed in 1982, and is reprinted below. The main data recording sheet is comprised of three types of observations: (1) setting, (2) individuals, and (3) observed behaviors.

Under location, provision is made for recording the name of the center being included in the study, the room or area being observed, the date and time, and the number of the observational cell corresponding to numbers previously indicated on a grid plan of the center and all its principle spaces (see Instructions for Use, below).

Under individuals involved, space is provided for recording the number and demographic characteristics of the children and adults involved in the behavior setting (group size, numbers of children and adults, number of girls and boys, number of children in different age categories from 2 to 6 years of age, and numbers of children of different racial or ethnic groups).

The major portion of the observation schedule is given over to space for recording observed behaviors. These are divided into seven sub-categories: (1) general type of behavior (engagement, transitional, functional, random, or withdrawn--for operational definitions see the Coding Book, below); (2) initiation of behavior (spontaneous free, individual directed, or group directed); (3) exploratory behavior (immersed, somewhat involved, not involved); (4) social interaction (cooperation, competition, aggression, affection); (5) teacher involvement (co-action, encouragement, control, information, observation, presence but no involvement, no teacher present); and (6) teacher-teacher interaction (group, colleague, observation, more than one teacher but no interaction, one or no teacher present). Ordinal and interval scales have been developed within categories (e.g., distracted, attending, an immersed under the category of engagement; parallel, associative, and cooperative activity under cooperation, and so on). Each of the categories and scales have been based on the existing research literature for that behavior type. For example, Parten's conceptualization of the stages of social participation of preschool children has become one of the classics of child psychology. She introduced six categories of participation in play behavior: unoccupied behavior, solitary play, onlooker behavior, parallel play, associative play, and cooperative play. This category system has been reused in any studies and has been simplified and reexamined in others. In the present observational schedule, Parten's six categories have been divided into two sections of the Observation Schedule. The two behaviors that are not strictly play behaviors (unoccupied and onlooker) are recorded under "general type of behavior," while the four types of play behavior (solitary, parallel, associative, and cooperative) are recorded under "type of social interaction--degree of cooperation."

Based on these and similar considerations, a detailed set of operational definitions have been prepared for training observers, for checking interjudge reliability, and for use in observation sessions (see Coding Book, below). For ease of recording, the schedule itself is reduced to fit on a single page for each observational cell. Multiple copies of the schedule may be made for research purposes only.

**Reliability and Validity.** The observation schedule and coding book were developed and tested in three steps. Training of test observers occurred at the same time, in 1982. Three test observers used the instrument in various draft forms for observing 10 behavior settings in each of two rooms at the University of Wisconsin-Milwaukee Child Care Center. Interjudge reliabilities were calculated, a debriefing occurred, and the instrument and coding book were revised after each of these sessions. Three observers used a revised instrument for observing an additional 20 behavior settings for 30 seconds each with a 2-minute recording period followed by a rest period in new settings. Interjudge reliabilities were calculated between pairs of judges, and the instrument, coding book, and time periods further refined. Two final test observers again used the instrument for observing another 20 behavior settings (observational cells--see Instructions for Use, below), for 10 seconds each, followed by a 1 minute and 50 second recording and rest period. Interjudge reliabilities were again calculated between judges and are reported in the next paragraph. The final observation schedule--reprinted here--along with all other instruments were submitted to and approved for use with infants through the oldest preschool children by the UWM Human Subjects Review Board.

To assess the reliability of the Environment-Behavior Observation Schedule, interjudge reliabilities were calculated after the second training and testing session (average percent of exact agreement between pairs of observers = 74.74%). After revisions of the instrument, and another retesting session, interjudge reliabilities were again calculated but in two ways. First, percent of exact agreements were calculated between the pair of observers (85.17%). Second, as the observational judgements were not just categorical, but in many cases ordinal and interval, and "percent of exact agreement" does not take into account chance agreement, Cohen's kappa ( $k$ ) coefficients were calculated for all items on the observation schedule. The results indicated very high agreement between the observers ( $k$ 's ranging from .66 to 1.00, only one  $k$  below .75, and average  $k$  = .86).

**Procedure for Using the Environment/Behavior Observation Schedule.** The procedure for using the Environment-Behavior Observation Schedule has three main phases.

First, each center to be included in a study needs to be contacted, the study explained, and informed consents obtained. Background information is likely best collected at this time (e.g., Center Profiles, Children Profiles, Teacher Demographic Profiles, etc.).

Second, data for all independent measures needs to be collected (e.g., possibly using the Teacher Style Rating Scale, Early Childhood Dimensions of Education Rating Scale, or equivalents, and the Early Childhood Physical Environment Scales).

Third, children's and staff behaviors in each of the settings are observed. Observations need to be done by trained observers on days, at times, and in observation cells randomly selected ahead of time. A randomly arranged schedule should be prepared and each center contacted to gain permission to observe at those times. If the time is not convenient (the center has planned a field trip for that day, or whatever), another randomly selected time should be tried, until mutually convenient times can be arranged.

When the observer(s) reach the center, it is suggested that they introduce themselves to the director and relevant teachers, but say no more about the intent of the study or of the administration of the behavioral mapping instrument than has been explained in a previous cover letter. The observer(s) should station themselves in a position in each room that will provide views of all observation cells but will not interfere with the children's behavior (e.g., the corner of a larger loft, a chair behind a bookcase in the corner of the room, etc.). All of this can be done with sufficient time before the official beginning of observation to allow the children to adapt to the new person and equipment in the room. If disruptions should occur, the observation session should be abandoned, and another randomly selected time should be tried.

The observer(s) will need a mini-tape recorder with unobtrusive ear plug-in, clipboard with observation forms, and pencils. The recorder can have time segments pre-programmed so as to avoid having to watch a clock or wrist-watch (10 seconds with 1 minute and 50 second breaks). Observations can likely be done for 20 minute sessions, then taking a 5 minute break, and then additional sessions of 20 minutes each for a 2-1/2 hour observation session (thus 50 observations can be made and recorded every 2-1/2 hours).

At each time beep of the recorder, the observer should move his or her attention to the next randomly pre-selected observation cell. If the cell is entirely empty of people, the observer can immediately look to the next cell indicated on the sheets. The total number of observational cases needed will depend on the research questions and/or hypotheses under investigation.<sup>3</sup> If the children move out of doors during a session, or en masse move to lunch or any other non-primary activity, the observations need to be interrupted for that period of time.

A coding sheet can easily be developed for the data based on the coding book and observational recording sheets. The data may then be input and analyzed using standard SPSS or SAS bivariate and multivariate parametric and non-parametric statistics depending on the purposes of the study, the research questions being pursued, and/or the hypotheses under investigation.

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<sup>3</sup> In one study conducted by the author (Moore, 1982), 1,200 observations were planned for each of two major hypotheses. Given that 50 observations could be made each half day (2-1/2 hours) or 100 per day, the study required 24 person-days of observation time spread out over a month.

## ENVIRONMENT/BEHAVIOR OBSERVATION SCHEDULE

### FOR EARLY CHILDHOOD ENVIRONMENTS \*

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#### INSTRUCTIONS FOR USE

The following behavior map observation schedule has been developed to rate or evaluate early childhood environments. It is designed in particular for the rating of child care centers and other early development settings (specialized preschools, outdoor play/learning environments, etc.), but is appropriate for other uses also (e.g., recreation environments, housing, neighborhood settings, etc.).

Based on a conceptualization of behavior being affected by social environmental and physical environmental factors (Moore, 1979), a number of important characteristics of the physical environment have been identified (measured on the Early Childhood Physical Environment Scales), a number of important characteristics of the social environment have been identified (measured on the Teacher Style Rating Scale and the Dimensions of Education Rating Scale), and a number of predicted behavioral consequences have been identified (measured on this Observation Schedule).

To use this Observation Schedule, follow the attached instructions, paying particular attention to the operational definitions of category terms:

1. Identify environments to be studied or evaluated.
2. Design the evaluation study.
3. Select subjects.
4. Decide on proxy variables to be measured in lieu of experimental controls (e.g., those measured by the Teacher Style and Dimensions of Education scales).
5. Train observers following the below and especially the operational definitions.
6. Map each environment on the sheet provided (photo-copy extra copies), and divide the environment into a grid of observational cells. It is recommended that the cells be approximately 60 square feet for indoor settings and no larger than 250 square feet for outdoor settings, and that the boundaries correspond to naturally occurring behavior settings. Draw the environment, indicate boundary lines, number each cell on the drawing, and put unobtrusive markers in the setting if necessary to let observers know the boundaries.

7. Decide on an observational period. Approximately 10 second observations are recommended, with 50 second record and rest time between observations. After deciding on time, and training observers, check on interobserver reliability. It should reach at least 85% exact agreement between pairs of judges before the main study begins. Arrange some systematic means of informing observers about time (e.g., beeps recorded on a hand-help audio recorder).
8. Conduct the observations, using one sheet for each observational period and cell. Select the cells randomly using a page of random numbers. Indicate the selected cell number in the space provided. If no activity is occurring in that cell, move to the next randomly generated cell number. It is recommended to prepare all information on the top line of the Observation Schedule before observation sessions. It is further recommended to do no more than about 40 minutes of observations without a 5 to 10 minute break.
9. Code and analyze the data according to procedures appropriate for the design of the study.

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This battery of observational techniques has been developed by Gary T. Moore with assistance from Naomi Leiseroff, Marleen Sobczak, and Harry Van Oudenallen. It may be copied for unlimited research use if appropriately cited. For more information, contact the Environment-Behavior Research Institute, School of Architecture and Urban Planning, University of Wisconsin-Milwaukee, Milwaukee, WI 53201.

ENVIRONMENT/BEHAVIOR OBSERVATION SCHEDULE FOR EARLY CHILDHOOD ENVIRONMENTS

SKETCH MAP AND OBSERVATIONAL GRID

Center:

Room or Area:

A large, empty rectangular box with a solid black border, intended for drawing a sketch map of the center and an observational grid. The box is currently blank.

Draw a sketch map of the entire center on one page, and of each room or major program area observed on a separate page. Indicate rough dimensions. With dashed lines indicate the observational grid for each room. Label each observational cell with a number and the name of the predominant activity in that cell over time. Record the relevant number on the observation schedule for each observational segment.

**ENVIRONMENTAL SETTING**  
 The Location of the Observed Behavior

Center

Room/Area

Observational Cell

**INDIVIDUALS INVOLVED**  
 The Number and Characteristics of Children and Adults Involved

Group Size  Children

Adults

Genders Girls

Boys

Ages 2 to 3

3 to 4

4 to 5

5 to 6

6 and over

Ethnicity White

Black

Hispanic

Other

**OBSERVED BEHAVIORS**  
 Observable Behaviors Characterized as a Whole or for Most of the Observation Segment

**SECTION 1: GENERAL TYPE OF BEHAVIOR**

Engagement  Immersed

Attending

Distracted

Transitional  Only Transitional

Partially Transitional

Primarily Engaged

Functional  Only Functional

Partially Functional

Primarily Engaged

Random  No Sustained Activity

Directed Interest

Spontaneous Interest

Withdrawn  Vacant Staring

Intermittant Focusing

Passive Observation

Empty Cell  Unclear

**OBSERVED BEHAVIORS (continued)**

**SECTION 2: CHILD-INITIATED VS STAFF-DIRECTED BEHAVIOR**

Initiated  Spontaneous Free

Individual Directed

Group Directed

Unclear

**SECTION 3: EXPLORATION**

Exploration  Immersed

Somewhat Involved

Not Applicable  Unclear

**SECTION 4: SOCIAL INTERACTION**

Interaction  Reciprocated

Acknowledged

Not Acknowledged

Not Applicable  Unclear

**SECTION 5: COOPERATION, COMPETITION, AGGRESSION, AFFECTION**

Cooperation  Cooperative Activity

Associative Activity

Parallel Activity

Competition  Absolute Gains

Relative Gains

Rivalry

Aggression  Physical Attack

Threatened Attack

Verbal Abuse

Affection  Intimate Physical

Friendly Physical

Verbal

Not Applicable  Unclear

**SECTION 6: TYPE OF TEACHER INVOLVEMENT**

Involvement  Co-Action

Encouragement

Control

Information

Observation

No Involvement

Not Applicable  Unclear

**SECTION 7: TYPE OF STAFF-STAFF INTERACTION**

Interaction  Group

Colleague

Peer Observation

No Interaction

Not Applicable  Unclear



ENVIRONMENT/BEHAVIOR OBSERVATION SCHEDULE  
OPERATIONAL DEFINITIONS AND CODING BOOK

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**PART I: ENVIRONMENTAL SETTING**

Indicate observational cell number and/or setting name. Indicate name of environment and unit within it (e.g., child care center and room).

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**PART II: INDIVIDUALS INVOLVED**

Indicate the number of individuals involved and their relevant demographic characteristics. Count all the individuals in each behavior setting at the beginning of the observation or entering during the observation period. Be sure to fill in all boxes with the appropriate number, even if zero; this will greatly aid subsequent key punching for computer data analysis.

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**PART III: OBSERVED BEHAVIORS**

Indicate which of the following developmentally appropriate behaviors characterize the group taken as a whole. If several behaviors are present, record them all. Fill in the appropriate boxes, at least one in each section. Training and pretesting should eliminate the use of the "unclear" box, but use it if necessary.

**1. GENERAL TYPE OF BEHAVIOR**

Engagement	Child is visually and/or physically involved with a point of focus. Point of focus may be another person, an object, an activity, or the child her or himself. Behaviors include: looking at focus, listening to focus, participating in a prescribed or spontaneously initiated activity, and/or touching or manipulating the point of focus.
Immersed	Totally immersed with point of focus, with very little or no time watching other points of focus or being interrupted.
Attending	Partial attention to point of focus and partial attention to other points of focus or being interrupted.
Distracted	Easily distracted or interrupted, spending more time watching other points of focus but still returning to the initial point of focus.

Transitional Behavior exhibited during the time between period of disengagement from one point of focus to engagement with another point of focus. To be considered a transition, the disengagement from one focus and the engagement with another focus must be anticipated or seen directly.

Only Transitional Only transitional behavior totally interrupting other behavior or coming between periods of engagement.

Partially Transitional Partially transitional behavior and partially engaged behavior in about equal proportions.

Primarily Engaged Displays some transitional behavior but is primarily engaged in a point of focus.

Functional Behavior intended to meet some physical bodily need. Behaviors include bathroom behaviors, tending to bodily injuries, eating or drinking, matters of personal hygiene, and attending to clothing.

Only Functional Functional behavior totally interrupts other types of behavior.

Partially Functional Partially functional behavior and partially engaged behavior in about equal time or content proportions.

Primarily Engaged Displays some functional behavior but is primarily engaged in a point of focus.

Random Behavior that is nondirected and shifts rapidly from one setting or object to another. Behavior that is impulsive, fast moving, and ineffective. Includes actions that are incomplete and hyperactive behavior.

No Sustained Activity Shifts rapidly between objects, activities, and/or settings. Shows no sustained point of focus.

Directed Interest Shifts between objects, activities, and settings but shows interest in at least one point of focus when assisted by another person.

Spontaneous Interest Shifts between objects, activities, and settings but shows spontaneous interest in at least one point of focus without assistance.

Withdrawn	Behavior that is not considered engagement, transitional, functional, or random, but appears to be withdrawn. Characteristic behaviors include vacant staring, staying close to adults without visually or physically exploring the environment, and indications of fearfulness such as crying, hiding, thumb-sucking, auto-manipulation, and trembling.
Vacant Staring	Vacant staring with no apparent point of focus. Includes thumb-sucking, auto-manipulation, and drowsiness.
Intermittant Focusing	Intermittant focusing on several different points of focus but with equal amounts of withdrawn behavior.
Passive Observation	Staring in one direction. Passive observation with no apparent engagement with the point of focus.
Unclear	Unclear which of the above best applies; undecided; cannot code.

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2. CHILD-INITIATED VS STAFF-DIRECTED BEHAVIOR

Initiated	The person or persons who initiated, suggested, or directed the behavior observed. Accurate coding of who initiated the behavior will require recall of the sequence of behaviors in a setting, e.g., to recall if a staff member initiated a sequence of behaviors by offering "options" or "choices" that the children then followed for a period of time.
Spontaneous Free	Spontaneous free choice. Child chooses from among all activities possibly available. An adult may or may not have made prior preparations, but has not suggested which activities to do.
Individual Directed	Someone other than the child has planned an activity in which all children participate, but which is carried out by each child individually or in small groups.
Group Directed	Someone other than the child leads an activity in which the children all participate as a group.
Unclear	Unclear which of the above best applies.

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3. EXPLORATION

Exploration	Behavior that is directed toward investigating, examining, studying, or searching out of an object, activity, or setting, or other points of focus.
Immersed Exploration	Completely immersed in exploratory activity. Includes inspection, manipulation, asking questions, producing effects, etc.
Somewhat Involved Exploration	Involved in exploratory activity in conjunction with another activity or activities. Includes being somewhat involved in exploratory play but not fully absorbed, such as glancing up or being interrupted.
Unclear	Unclear which of the above best applies.
Not Applicable	No evidence of exploratory behavior among the one or more children in the setting.

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4. SOCIAL INTERACTION

Degree of Interaction	Behaviors that are directed toward or involve large amounts of social interaction between two or more children and/or one or more adults, but not between adults alone. Includes visual, verbal, and physical interaction, either around an external point of focus or between the people directly.
Reciprocated	Exhibits social behavior that is reciprocated by another person.
Acknowledged	Exhibits social behavior that is acknowledged by another person but that is not reciprocated or answered.
Not Acknowledged	Exhibits social behavior that is neither reciprocated nor acknowledged by other persons present.
Unclear	Unclear which of the above best applies.
Not Applicable	No evidence of social interaction behaviors involving children or only one person present in the setting.

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5. COOPERATION, COMPETITION, AGGRESSION, AFFECTION

Cooperation	Working together toward a common goal. Association for mutual benefit, or engaged in a joint enterprise.
Cooperative Activity	The efforts of one or more children are supplemented by those of another or others. Included is use of a common object, sharing of play materials, organization toward a material product, and playing formal games.
Associative Activity	Overt recognition of common activity, interests, and/or personal associations, but no organization of activity or clear cooperation toward a common goal. Includes borrowing toys, following one another, engaged in similar activities side-by-side.
Parallel Activity	Independent activity bringing the child among others. Includes playing with objects that are similar, playing beside rather than with other children.
Competition	Striving or vying with one another or others for personal or group advantage.
Absolute Gains	Maximizing personal or group gains at the expense of another person or group.
Relative Gains	Obtaining more than a peer, but not through overt and direct competition with the other.
Rivalry	Attempts to minimize gains of a peer, but without success. Includes attempts to equal and surpass, or to pursue the same object or person.
Aggression	Commencing hostile actions or behaviors, including verbal quarrels, visual hostility, and physical attacks.
Physical Attack	An actual attack. Includes hits, strikes, snatching or damaging property of others, pushing, pulling, including injury by agent.
Threatened Attack	Threatened attack upon another person. Includes threatening gestures, verbal threats, verbal conflicts over ways of using things, enticing others to attack a third person.
Verbal Abuse	Verbal but not physical aggression. Includes annoying, teasing, commanding, demanding, humiliating when carried to extremes.

Affection	Showing of fond feelings or affection toward one or more other children or adults.
Intimate Physical Affection	Behavior directed toward another person or persons that indicates very warm regard and involves physical contact. Includes kissing, patting, fondling, hugging.
Friendly Physical Affection	Less intimate or less physical behavior toward another person or persons that indicates warm regard or emotions and involves less physical contact. Includes smiling, holding hands, touching.
Verbal Affection	Emotional expression involving verbal communication but not physical contact. Includes speaking in a friendly manner, laughing with someone else, reassuring, complementing, offering praise, expressing warm feelings.
Unclear	Unclear which of the above best applies.
Not Applicable	No evidence of social interaction behaviors involving children or only one person present in the setting.

6. TYPE OF TEACHER INVOLVEMENT

Involvement	Some manner of involvement of the teacher or other adult in the activities of the children.
Co-Action	Teacher and child work or play together as partners.
Encouragement	Teacher responds to cues from child, offers suggestions, gives opinions when asked, gives verbal reinforcement, accepts feelings and ideas, praises or complements, shows verbal or nonverbal comfort, etc.
Control	Teacher tells child what to do or what not to do. Controls, criticizes, gives directions or directive comments, justifies authority, gives orders, etc.
Information	Teacher formally or informally gives information, instructions, asks rhetorical questions, offers instrumental help, answers direct questions, etc.
Observation	Teacher watches with no apparent interaction.

No Involvement      Teacher in proximity to behavior and setting, but with no apparent involvement in activity, including no observation of the activity. Includes looking elsewhere, being involved in own activity, being interrupted.

Unclear      Unclear which of the above best applies.

Not Applicable      No teacher in behavior setting.

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7.      TYPE OF STAFF-STAFF INTERACTION

Interaction      Verbal, visual, or physical interactions between two or more staff members or other adults either in the presence of children or by themselves.

Group Interaction      Group meetings, group discussions, joint action, working together on a task, etc.

Colleague Interaction      Informal interchange regarding children, curriculum, policies, feedback, reaction, advice, etc.

Peer Observation      One or more teachers watching other teachers, either formally or informally, without verbal interaction.

No Interaction      Two or more teachers in the setting, but with no noticeable interaction between them.

Unclear      Unclear which of the above best applies.

Not Applicable      No teacher or only one teacher in the behavior setting.

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