Are we using lighting effectively?

Turning On the Light: Thinking about Lighting Issues in Child Care

by Nancy P. Alexander

It's nap time. In child care centers across the nation, blinds are closed, shades lowered, and lights switched off to create an atmosphere of rest and relaxation. In dark rooms, teachers sit by small lamps or by doors open to lighted hallways while making lesson plans, catching up on paper work, or reading professional articles while supervising sleeping youngsters.

Later in the day, teachers and children alike rejoice that the sun now peeks through white clouds after three continuous days of dreary, gray weather. Voices are cheerful with anticipation as young children scurry outside to enjoy the welcome sunshine.

We react physically and emotionally to light. Our moods are affected by light or the absence of it. Our ability to function at peak performance or to comfortably complete tasks is dependent on the amount and quality of light. Too much light can be irritating and overstimulating; too little can make visual tasks difficult. Bright, glaring light causes one to squint and may cause fatigue; long periods of darkness can even contribute to depression.

In the northern hemisphere where days and nights are dark for months at a time, high rates of Seasonal Affective Disorder (SAD) are common. SAD, a mood disorder, is manifested by symptoms including fatigue, lethargy, overeating, social withdrawal, and, in severe cases, depression (Waldrop, 1991; Rosenthal, 1993). Some estimate that 12 million people in the US are affected, and that 30% of those living in the far North suffer from SAD, a direct result of reduced light levels during the winter (Castleman, 1991).

Treatment for the disorder is generally photo therapy, a routine of exposure to high levels of artificial light administered during specific times of the day under professional supervision. Other problems such as alcoholism are also attributed to the long winters lacking sunshine.

Scientific evidence related to the effect of lighting on adults' productivity, rhythms of sleep and wakefulness, and moods has been accumulating for some time. More or brighter light is not necessarily the answer to providing suitable lighting. In fact, there is some evidence that too much light may contribute negatively to the types of behaviors we desire.

In one study, Baron et al. (1992) implicates lighting as an environmental cue to induce what he termed "positive affect." People with positive affect were defined as those more likely to help others, volunteer for tasks, and "see the big picture." According to Baron, dim (below 200 lux), warm (approximately 3000K) illumination appears good for inducing positive affect. He recommends these levels when satisfying interpersonal relationships are important (Rea, 1992), certainly an important goal in early childhood programs.

National consensus standards for lighting for educational facilities have been established by the Illuminating Engineering Society of North America. Recommendations for proper lighting involve a complex assessment of tasks performed, the importance of the visual tasks, and the speed at which they must be performed. Leisurely recreational reading, for example, does not require the same lighting as

extended studying or reading technical reports, although the print size might be the same (IES, 1988). However, these standards pertain to elementary schools, secondary schools, and universities, where visual tasks differ from the typical activities of a child care center or preschool. To simply take standards intended for elementary, secondary school, or university tasks and adapt them to younger children is inappropriate.

Considering the importance of light in our lives, we have very little literature about its effect on children's development and behavior. We have even less information for guidance in planning lighting for child care centers. Yet with little research specifically related to young children, how can standards exist, and what guidelines do we use in planning lighting for our programs? The absence of such research is, well, glaring. Ever increasing numbers of young children spend up to ten hours per day in group programs in environments where all influences on their well-being need to be addressed.

Lighting Transitions

The eye is a wonderful mechanism that adjusts to a wide range of light levels. However, rapid or frequent adjustments can be tiring as when one passes in and out of high contrast situations. Going from a bright classroom into a dim hall and back again regularly can be tiring to one's eyes. A sudden change in light level as when lights are abruptly turned off or on can be unsettling, too.

Traveling through the redwoods of California made this point evident to me last summer. Although the area was quite dark, one would frequently come to gaps where bright sunlight shone through the trees, creating an uncomfortable, irritating effect. These sporadic bursts of light into an otherwise dim area were fatiguing and unpleasant to experience.

We accept the need to plan transitions in activities in early childhood programs. We recognize the need to give children a means of winding down after active play. We should also consider a transition plan for changing light levels. A gradual darkening of a room through the use of dimmer switches or other means can help make a transition from activity to nap time; opening blinds or curtains and increasing the room's ight slowly will help provide a light transition for children waking up from naps or going to the outside from indoors.

We know well the startling effect when an audience is faced with a sudden bright screen at the conclusion of a slide show in a dimly lit room. Yet in most child care settings, no provisions are made for increasing light levels progressively, and children wake up to sudden bright lights. Rarely are there means of controlling light intensity in increments.

Consider installing dimmers in your classrooms. Dimmers allow one to lower or raise light levels gradually, rather than abruptly. They also allow centers to take advantage of good natural lighting on bright days and increase inside light when needed on overcast days.

Lighting Flexibility

If building or remodeling is in your plans, look for ways to make use of natural light when possible. Increasingly, windows are smaller, fewer in number, or omitted in building design plans, a response to security concerns or energy costs. Investigate skylights, double glass panes, and other ways to make use of natural light yet still address security and energy concerns.

Traditionally, in early childhood programs, we have simply had overhead fixtures that are either off or on. Yet planning for more flexible lighting that can be adjusted will allow us to adapt light levels according to the tasks involved. According to the Illuminating Engineers Society, "when lighting is effectively used, it can attract and hold attention, stimulate learning, and influence behavior in a positive way" (IES, 1988).

Museums and art galleries are designed with careful attention to lighting. Various lighting arrangements are used to focus attention on featured works by spotlighting or to create a pleasing atmosphere in which to leisurely view works of art or artifacts through indirect lighting. Borrow from what the designers and curators know. Why not focus attention on a classroom area by spotlighting it? We do not need the same level of light for all tasks. Why not make use of track lighting to emphasize specific classroom areas?

Look at your room arrangement and how light works. Consider the location of windows and light fixtures in planning classroom arrangement. It seems possible that placing the quiet areas such as a library area for preschoolers in a lower lighted area would create a restful atmosphere, with the area obvious. (The area obviously should be well lit enough for children's *reading* of books.)

Children are attracted to light they can control. Growing tall enough to reach the light switches is a milestone of development; give a child a flashlight and see what happens. Make use of their attraction to controlling light by including lighting

other than standard, overhead fixtures — separately controlled lights for specific areas of the room, individually controlled lights where they are needed.

Assessing Light Quality

Comfortable, adequate lighting is not just a matter of brightness. Glare, reflections, contrast of light and dark areas, and shadows affect the quality of light in the environment. Take a tour of your facility specifically to assess lighting.

• How does it feel when you come inside on a bright day? Is there adequate lighting inside? Does it seem dreary by comparison?

• Look at the room from the child's point of view. Just as room temperatures should be measured at the children's level, evaluate the light at their level, too. Equipment may block illumination from fixtures, creating dim areas that are not readily apparent to adults.

• Are there glares that are a problem? Shiny surfaces that create glare and reflections can cause visual discomfort.

• What about early in the morning and late in the evening? The angle of the sun may be a problem if it shines directly through east or west windows during certain times of the day.

Here are some inexpensive tips to increase the lighting you have:
1. Keep fixture covers clean. Dirt and dust can reduce output from a fixture. Washing the covers regularly will remove the layers of dust that settles on the underside and block light.

2. Consider the size and type of the bulbs. Will your fixture take larger ones? Can you change from 75 watt bulbs to 100? If you have fluorescent fixtures, there is a wide variety of fluorescent tubes, with generally *warm* or *cool* designations meaning less light output. Many bulbs, both incandescent and fluorescent, are designed to create a warm, inviting environment in the home, and may not be as effective in a classroom. Experiment to see what works best for you.

3. Look at various types of shields available for fluorescent fixtures. Some allow more light to pass through than others. Take a flashlight when you go shopping to test those you are considering. The shields for most fixtures are inexpensive, and replacing them may increase light levels significantly.

4. Provide on-task lighting. Clip-on lamps, undercounter fluorescent lights, and track lighting are some inexpensive ways to provide supplemental lighting for teachers' work areas or where additional lighting is needed for specific tasks.

5. Keep flashlights or other portable lights on hand for odd tasks requiring occasional increased lighting. Searching for a missing puzzle piece behind a cabinet, hooking up a computer cable, or cleaning out that dark, catch-all closet will be easier with a portable light source.

6. Since walls and ceilings must be painted periodically, use a neutral, light color when you repaint to make existing fixtures more effective. Light-colored walls and ceilings reflect light and will improve the lighting that you have.

7. Be sure all sockets have working bulbs, replacing bulbs and washing fixtures as often as needed.

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