The Influence of Fluorescent Lighting on Children

By Professor Manuel Cabrera Jr.

University of California, Los Angeles
Part I: Research Summary

Fluorescent lighting has measurable negative effects that could impact children in their everyday life:

✓ Fluorescent lighting negatively impacts the health and education of children

Use of high-pressure sodium vapor lamps in low-daylight classrooms is linked to slow rates of growth and development, poor class attendance, and low achievement levels.\(^1\) Fluorescent lighting has also been evidenced to worsen the symptoms of pre-existing behavioral disorders in children. For example, research suggests that the flickering nature of fluorescent lighting increases symptomatic repetitive behaviors in autistic children.\(^2\)

✓ Fluorescent lighting can have negative effects on the work of children

Besides the specific effects on children, fluorescent lighting has a wide range of negative effects on general health. One aspect of fluorescent lighting that medical research indicates has an effect on health is the so-called ‘flicker effect.’ Fluorescent lighting is produced by the rapid firings of electric discharges in the bulb, creating a rapidly flickering stream, instead of a continuous stream of light. Usually, this flicker is not visible, however it has been shown to affect the basic brainwave pattern (what is known as the EEG)\(^3\) and to decrease work efficiency.\(^4\) In addition, there is medical evidence linking the flicker effect to eyestrain, fatigue, and a decrease in visual performance in children.\(^5\)

✓ Fluorescent lighting can diminish the quality of personal interactions

Fluorescent lighting has other negative effects because of its impact on the visual system. For example, under fluorescent lighting, warm colors appear dull to children, and the prominence of blue in much of the fluorescent lighting makes their skin appear unhealthy.\(^6\) Narrower spectrum fluorescent lighting can make the classroom environment appear less vibrant and inviting.\(^7\) These effects threaten to negatively impact children’s interactions with, both, other children and adults.

\(^1\) Hathaway 1994.
\(^2\) Coleman et al. 1976.
\(^4\) Küller and Laike 1998.
\(^6\) Veitch et al. 2002.
\(^7\) Boyce et al. 2002.
Fluorescent bulbs contain dangerous levels of mercury

Both traditional fluorescent lights and CFLs contain dangerous levels of mercury, which can cause damage to a child’s brain, liver, and lungs, as well as sensory impairment. In fact, a CFL contains just as much mercury as a large, old-fashioned fluorescent bulb. Because of this danger, the Environmental Protection Agency has issued hazardous waste warnings, and recommended complicated procedures for recycling used bulbs and cleaning up broken ones. In contrast, LED lights don’t contain any mercury.

Fluorescent lighting has effects on general health that can impact children

Compact Fluorescent Lights (CFLs) produce more UV light than traditional incandescent bulbs, and thus can cause damage to a child’s unprotected skin more rapidly. This danger is more pronounced when CFL bulbs are used in desk lighting or close proximity task lighting applications. Also, the UV/blue light radiation from CFLs has been identified as a potential risk factor that aggravates the symptoms of children with light-sensitive skin conditions.

Fluorescent lighting can indirectly affect a child’s health through its effects on food quality in food storage areas. Scientific research indicates that fluorescent lighting affects the nutritional quality of meats, dairy, and produce. For example, studies indicate that it reduces the amount of vitamin A and riboflavin in milk, as well as leading to a noticeable deterioration in flavor. In regards to meat, fluorescent lighting leads to more rapid discoloration of both beef and pork, and evidence indicates that LED lighting results in less rapid discoloration and a longer shelf life than Compact Fluorescent Lighting. In regards to produce, fluorescent lighting is linked to more rapid greening in potatoes.

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8. These instructions can be found on the EPA website, at <http://www.epa.gov/cfl/cflrecycling.html>
9. These instructions can be found on the EPA website, at <http://www.epa.gov/cfl/cflcleanup.html>
Bibliography

(All of the references below are contained in their entirety in the Research Packet that follows, except those followed by a “**”)


