



The Role of Noise and Density in School Health & Safety



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Noise and Density

Noise & Density relation to school health & safety

- Psychological health
- Physical health
- Cognitive development
- Socio-emotional development

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Effects on psychological health

Self-rated symptoms of stress
Learned helplessness
Withdrawal

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Effects on physical health

Increased blood pressure levels in children
Feeling tense
Mental and voice fatigue in teachers

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Noise and children's learning

Effects of chronic exposure to noise

- difficulty completing complex tasks
- difficulty in concentrating
- indiscriminate tuning out of stimuli
- negative effects on standardized measures of achievement for school-age children

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Attention/Perception

Ability to sustain voluntary attention and to concentrate is important for children's ability to learn.

- children in noisy schools have more difficulty concentrating on class work than those in quiet schools
- indiscriminate tuning out of stimuli
- chronic exposure to noise increases auditory discrimination deficits

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Academic Achievement

What is the link between noise and reading?



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Noise Effects Summary

- Chronic exposure to noise contributes to: -
- attentional deficits in children
 - reading deficits in children
 - language acquisition deficits in children
 - learned helplessness
 - negative health effects

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What can be done

Prevention

Eliminate unnecessary noise sources

1. Appropriate design of mechanical equipment and lighting
2. Do not use radio or other sources for white noise, background noise
3. Use leg tips on moveable furniture

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Site Selection

1. Do not locate new schools near airports, major highways and busy city streets, or near railroad or subway tracks
2. Anticipate possible site changes by building in a buffer, i.e., trees

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Adjacencies

Group noise generating spaces (e. g., cafeteria, music rooms) away from classrooms

Scheduling

Take care in scheduling such activities as band practice

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Classroom

1. Give written & oral instructions. Visual aides
2. Keep directions simple
3. Seat children in groups, reduce time when giving instructions to entire class
4. Special needs of children with disabilities

Cafeteria

Use small tables to reduce group size

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School crowding effects

Effects of school size on academic achievement

Effects of class size on academic achievement

Effects of square footage on academic achievement

Effects of school crowding on behavior

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Effects of school size on academic achievement

- Math and verbal ability negatively affected by elementary schools larger than 200 students
- Smaller elementary and high schools related to improved academic achievement in urban school systems
- Inner city children particularly benefit from smaller school size

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Effects of class size on academic achievement

- Reduced class size improves academic achievement
- Class sizes must be reduced significantly to achieve best gains, 13-17 students per class is ideal
- More concentration, cooperation and involvement in activities in smaller group sizes for preschool children
- Higher scores on school readiness tests for preschool children in smaller groups (less than 15 children)
- Higher scores on measures of cognitive style in smaller preschool groups

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Effects of square footage on academic achievement

- Small activity-specific spaces increases concentration
- Less square feet per child related to lower reading scores in elementary school, especially girls

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Effects of school crowding on behavior

- More fights, attempts to control personal territory
- More disruptive, aggressive behavior
- More hostile, competitive behavior
- More acts of vandalism

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Conclusions

Physical environment plays key role in children's learning environment

Physical environment can be a source of stress to children affecting their ability to learn

Physical environment affects adults and children

Physical environment must be evaluated in an ecological context rather than isolating single factors

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What can be done

1. Provide student personal space
2. Create small work/activity groups
3. Plentiful learning and play resources
4. Reduce clutter:
 - eliminate displays that do not relate to current topics (too much is over stimulating)
 - keep displays at children's eye level

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What can be done

5. Provide adequate classroom storage space
6. Reduce noise levels
7. Provide spaces for restoration
8. If possible, reduce class size and school size

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Policy Implications

Address issues on multiple levels

**Poor schools and daycare centers can intensify
poor residential and family situations**

**Increased understanding of community attributes
related to children's learning**