

The Impact of Colorful Spaces

Marienhause Children's Clinic
St. Elizabeth

Neuwied / Germany

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FACTS (1)

- The owner of the clinic is Marienhaus
- Founded in 1903
- 1867 Franciscan nuns established the hospital
- 1901 happened the dedication of the hospital
- From 1960 to 1964 the children and youth medical clinic was constructed
- 1967 the building was completed
- 2002 happened the opening of new admission areas which was groundbreaking for a new intensive care unit

FACTS (2)

- The hospital has...
 - 663 beds,
 - 153 doctors,
 - 475 caregiving staff and
 - 105 special therapeutic staff.
- In total the hospital has...
 - 4.000 inpatient cases / children & adolescents each year
 - 500 newborns and premature babies each year
- The average length of stay was 4.6 days

TEN PROBLEMS

1. Patients are ripped out of the setting to which they are accustomed.
2. The term "hospital" has negative associations.
3. Patients are afraid of upcoming invasive medical interventions.
4. The "Hospital" as an institution is not transparent for new-arrivals.
5. The experience of loss of control is extremely painful. (Dutke, Schönplug & Wischer, 1992, S. 329; Monz & Monz, 2001)
6. Social interactions are influenced by the physical environment.
7. The environment has symbolic value.
8. Design characteristics can hinder or advance desirable therapeutic changes.
9. The built environment can foster or relieve stress.
10. Building characteristics indicate to the patient what role is expected from them. (Heeg, 1994, S. 86, 87)

QUESTIONS AND METHODS

- Which design characteristics are evaluated positively, which are negatively? (Mean values)
- Did the reconstruction result in changes to the selected characteristics of the building? (T-tests)

OPEN QUESTIONS

- What do you like best about the children's hospital?
- What would you like to change about the children's hospital?
- Which future considerations should be made in order to build a forward-looking children's hospital?

COLORFUL SPACES CAN MAKE CHILDREN HEALTHY I

- The design of buildings and interior rooms influence people's well being
- It can make people sick, but it can also foster recovery
- First study in Summer Semester 2012
 - Focus: period before the renovation and expansion of the existing areas of Children's and Adolescents' Clinic
- Second project in Winter Semester 2012
 - Focus: results of the renovation

SCALE FOR THE EVALUATION SURVEY

Present quality	Very good	Good	Average	Poor	Very poor
	😊😊	😊	😐	😞	😞😞
	+2	+1	+ -0	-1	-2

Importance in future	Very important	Important	Somewhat important	Unimportant	Very unimportant
	😊😊	😊	😐	😞	😞😞
	+2	+1	+ -0	-1	-2

PARTICIPANTS

- 32 students in WS (52 in SS)
- 30 staff in WS (46 in SS)
- 29 patients in WS (28 in SS)



EXPLANATION OF TERMS

- A significant result means that there is a low probability % for $p = .01$, that the result occurred randomly
- A test of significance determines whether a hypothesis is suitable

EXPLANATION OF TERMS – T-TEST

- Do the mean values of two measurements (1. at present and 2. importance in the future) differ significantly?
- In our study, we used a significance level of $p = .01$ for all T-tests

Mapping Sentence

Individual

Person (p)(a1=students)
(a2=staff)
(a3=patients)

Reference plane
(cognitive/affective)
specifically

of the environment
(c1=location/infrastructure)
(c2=façade/exterior)
(c3=entrance)
(c4=dining area/kitchen)
(c5=traffic area)
(c6=waiting rooms)
(c7=spaces for "little patients")
(c8=intensive care/infirmery)
(c9=medical gymnastics and physical therapy)
(c10=ambulance area)
(c11=technology)
(c12=security)
(c13=special rooms/areas) and
(c14=building overall)

Criteria
(d1 = functional)
(d2 = aesthetic-creative)
(d3 = social-physical) specifically
(d4 = ecological)

Regarding
regulation)

evaluates

(b1=present situation)
(b2=future importance)

Control of environment
(e1 = dilapidation)
(e2 = destruction)
(e3 = beautification)
(e4 = signs of distinct changes)
(e5 = distinct opportunities for

(e6 = no control)

and the effect on patient healing, staff performance, communication between patients and staff, and well-being of patients rated according to

Rating scale

(f1 - +2 = "very good" "very important")
(f2 - +1 = "good" "important")
(f3 - +0 = "average" "neither important nor unimportant")
(f4 - -1 = "poor" "unimportant")
(f5 - -2 = "very poor" "very unimportant")
(f6 - 9 = "no answer possible")

Mapping Sentence

Additionally, (P) estimates the overall impact (f) on particular environmental factors in reference to

Relevance levels

(b1 = Present quality) regarding
(b2 = Important in future)

Reactions

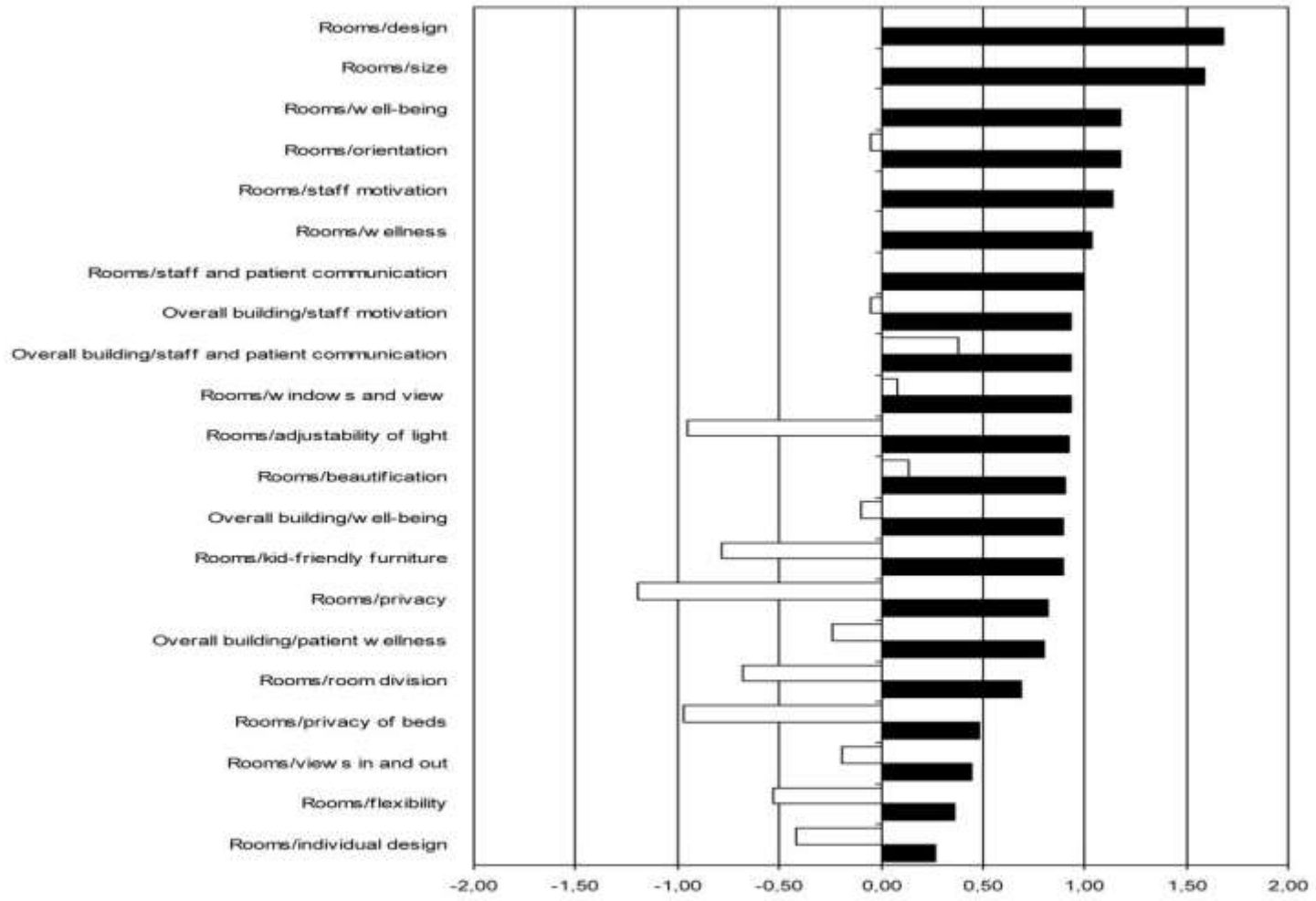
(g1 = health)
(g2 = performance)
(g3 = communication)
(g4 = well-being).

The individual (p) estimates the contribution of the building in terms of the criteria (h)

(h1 = The building contributes to the realization of the goal of being a "Children's Hospital of the Future.")
(h2 = The building contributes to earlier patient discharges, due to the fact that patients become healthy more quickly.)
(h3 = The building contributes to the fact that patients would gladly return, if they became sick again.)
(h4 = The building contributes to the fact that qualified staff are motivated to apply for a job in this particular hospital.)
(h5 = etc.)...

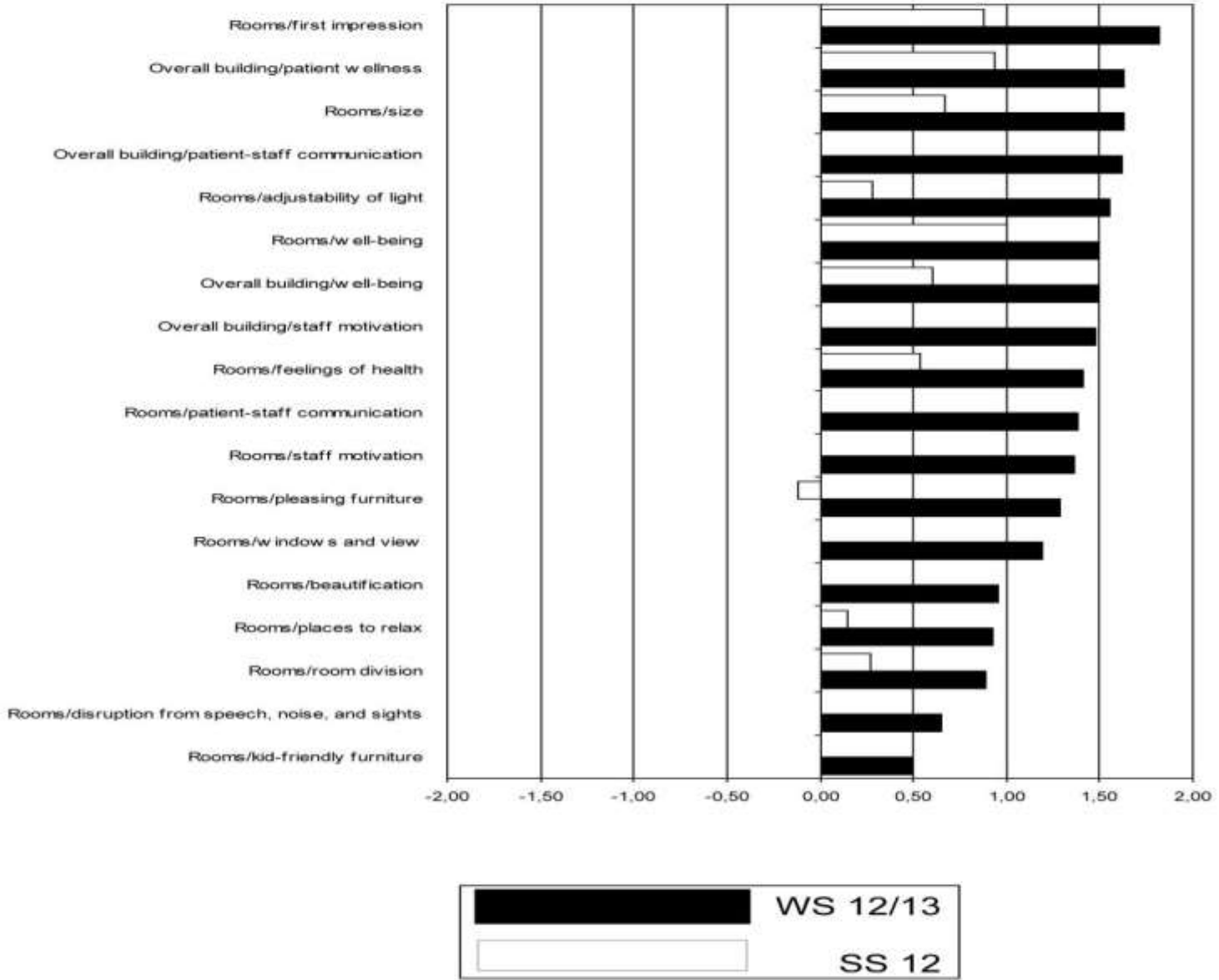
RESULTS

Staff: Spaces for "little patients" t-test



Patients: Spaces for "little patients" t-test

RESULTS



WS 12/13
 SS 12

RESULTS

Patients and
Parents
SS before
the
Expansions

1. What do you like most about the hospital building?	
Staff (doctors, nurses, midwives)	13
Friendly doctors and nurses	13
Supervision of children	5
Playroom	2
Attentive and loving supervision of children	1
Someone is always watching me	1
Games	1
Food/meals/rooms	4
Food	2
Breakfast	1
Dinner	1
Rooms	4
Cafeteria	1
Elevators	1
Large corridors	1
Kiosk	1
Design	3
New design	1
Mobiles	1
Window pictures	1
Equipment	2
Good equipment (modern) for all devices	1
TVs	1
Places for parents to sleep	1
Service	1
View	1
Total entries	32
People	21

2. What would you like to change about the hospital building?	
Only single/family rooms for young children	6
Room colors	2
Room needs more decoration	1
More space in the rooms	1
Reading lamps for me and parents	1
Cable connection	1
Individual rooms for children or parents with infections	1
Toys	9
TV, playstation, Wii, and many games	2
More toys	1
Assortment of toys checked for completeness	1
More opportunities for play, or crawling for very small children	1
Books/games for toddlers (up to 4 years)	1
A larger playroom and play furniture	1

More variety for youth and children	1
Surprises	1
Food	3
Kid-friendly food	2
Lunch in room/cafeteria	1
Equipment	2
More warming lamps and more opportunities for changing or bathing	1
Friendlier and more colorfully furnished	1
Supervisor: trainees should be better controlled	1
Calmer atmosphere	1
Station room on 3rd floor	1
More greenery	1
Library	1
Kid-friendly sanitary stations	1
Total entries	33
People	17

3. What do you think should be considered in order to construct a forward-looking hospital?	
Room furnishings	17
Parent-child rooms	4
Nightstand lamp	3
Colors and pictures	2
Movable furniture	2
Sockets	2
Friendly rooms	1
Better visual separation from other patients	1
Larger rooms	1
Cable connection	1
Games or toys	4
More room to play	1
Play-area	1
More variety for youth and children	1
Toys	1
Parking spots	2
Free parking	1
Many parking spots	1
Definitely family-friendly rooms	1
...if the nurses would stick around	1
Better signage from the B9	1
Shape the parents' stay more positively	1
Better climate-control	1
More places for the patients and their families to relax	1
Lunch in room/cafeteria	1
Larger toilets or washrooms	1
Sick children	1
Total entries	32
People	16

COLORFUL SPACES CAN MAKE CHILDREN HEALTHY II

- The researchers are very satisfied with the end result
- Expansion and redesign improved:
 - employees' job performance
 - employees' communication with patients
 - patients' overall well-being
 - employee motivation
- Respondents lauded the improved orientation
- Even the new waiting rooms, which were almost entirely negatively evaluated before the renovation, were now overwhelmingly seen as positive

FACIT

- The results were obtained through surveys:
- 84 students in both semesters
- 76 employees and
- 57 patients were surveyed.

The surveys carefully examined different areas of the Children's and Adolescent's Clinic, asking respondents to give each area plus or minus points (Sadler, DuBose & Zimring, 2008).

- An example is the new ambulatory clinic. In this area, employee motivation appears to have improved markedly. Furthermore, respondents lauded the improved orientation. Even the new waiting rooms, which were almost entirely negatively evaluated before the renovation, were now overwhelmingly seen as positive.

- Even more distinct were the results for the brightly colored design of children's rooms. Despite the almost entirely positive evaluations, there were also some criticisms, like the relatively long hallways, the signage, or how equipped the clinic is with gaming devices. The researchers have compiled all of these details. Future planning for other clinics can now refer to these results as a guide.

LOCATION



FOYER



CAFETERIA



TRAFFIC AREA



WAITING AREA



ROOM FOR A „LITTLE PATIENT“



INTENSIVE DEPARTMENT



REMEDIAL GYMNASTICS



SAFETY



SPECIAL PLACE FOR CHILDREN



AMBULANCE AREA



BUILDING



BUILDING



BUILDING



BUILDING



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REFERENCES

- Blumberg, R. & Devlin, A.S. (2006). Design Issues in Hospitals. The Adolescent Client. *Environment and Behavior*, 38, 3, 293-317.
- Borg, I. & Shye, S. (1995). *Facet theory: form and content*. Newbury Park: Sage.
- Borg, I. (1996). Facettentheorie. In E. Erdfelder, R. Mausfeld, T. Meiser & G. Rudinger, *Handbuch Quantitative Methoden, Kap. 18*. Weinheim: PVU.
- Burge, S.A., Hedge, A., Wilson, S., Harris-Bas, J. & Robertson, A. (1987). Sick building syndrome: a study of 4373 office workers. *Ann. Occ. Hygiene*, 31, 493-504.
- Carpman, J.R. & Grant, M.A. (1993). *Design that Cares - Planning Health Facilities for Patients and Visitors* (2nd edition). Chicago, IL.: American Hospital Publishing, Inc. (AHA).
- Clements-Croome, D. (2000). Indoor environment and productivity. In D. Clements-Croome (Ed.), *Creating the Productive Workplace* (p. 3-17). London: E & FN SPON.
- Dilani, A. (1999). *Design and Care in Hospital Planning*. Stockholm. Karolinska Institutet. Institute for Psychosocial Factors and Health. Public Health and Treatment Research. Design & Health.
- Monz, A. & Monz, J. (2001). *Design als Therapie. Raumgestaltung in Krankenhäusern, Kliniken, Sanatorien*. Leinfelden-Echterdingen: Alexander Koch.
- Preiser, W.F.E. & Vischer, J.C. (2005). The evolution of building performance evaluation: an introduction. In: W.F.E. Preiser & J.C. Vischer (Eds.), *Assessing Building Performance: Methods and Case Studies* (pp. 3-14). Oxford: Butterworth-Heinemann (Elsevier).

REFERENCES

- Preiser, W.F.E. (2005). Building Performance Assessment - From POE to BPE, A Personal Perspective. *Architectural Science Review*, 48, 1-12.
- Shepley, M.M. & Davies, K. (2003). Nursing unit configuration and its relationship to noise and nurse walking behaviour: An AIDS/HIV unit case study. *AIA Academy Journal* Retrieved 09/03/2008 http://www.aia.org/aah_a_jml_0401_article4
- Shepley, M.M. (2002). Predesign and post-occupancy analysis of staff behaviour in a neonatal intensive care unit. *Children Health Care*, 31 (3), 237-253.
- Ulrich, R.W., Zimring, C., Joseph, A., Quan, X & Choudhary, R. (2004). The role of the physical environment in the hospital of the 21st century: A once-in-a-lifetime opportunity. Concord, CA: The Center for Health Design.
- Varni, J.W., Burwinkle, T.M., Dickinson, P., Sherman, S.A., Dixon, P., Ervace, J.A. et al. (2004). Evaluation of the built environment at a children's convalescent hospital: Development of the Pediatric Quality of Life Inventory parent and staff satisfaction measure for pediatric health care facilities. *Journal of Developmental and Behavioral Pediatrics*, 25 (1), 10-20.
- Walden, R. (2006). The Effect of Hospital Building on Patient Recovery. In A. Dilani (Ed.), *Design & Health IV. Future Trends in Healthcare Design* (pp. 99-114). Huddinge, Sweden: International Academy for Design and Health.

REFERENCES

- Walden, R. (2008). *Architekturpsychologie: Schule, Hochschule und Bürogebäude der Zukunft*. Lengerich: Pabst Science Publishers. 532 Seiten.
- Walworth, D.D. (2005). Procedural-support music therapy in the healthcare setting: A cost-effectiveness analysis. *J. Pediatric Nursing*, 20(4), 276-284.
- Zimring, C. (1994). *A Guide to Conducting Healthcare Facility Visits*. Martinez, CA.: The Center for Health Design.