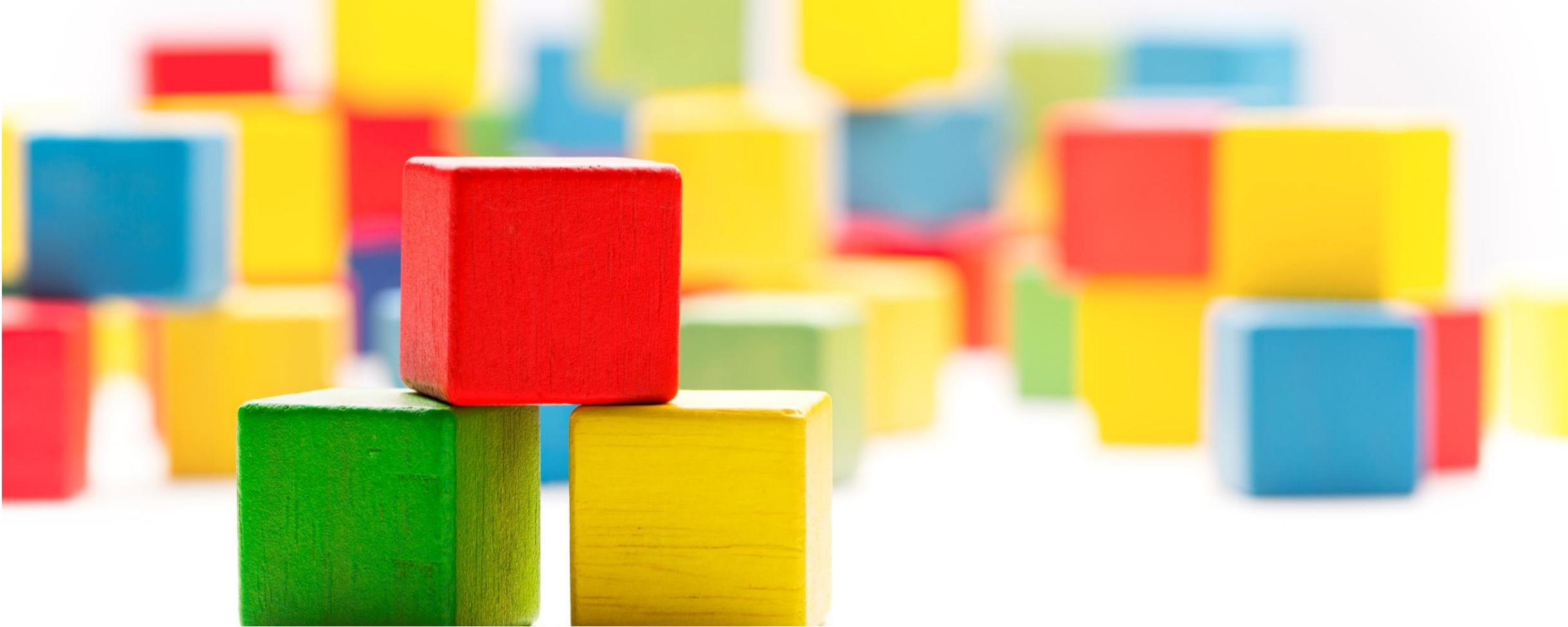




COGNITIVE LOAD THEORY IN NURSING EDUCATION

SANDRA NIELSEN PHD
PRESENTED TO MCN
CURRICULUM COMMITTEE
OCTOBER 2025

Enhancing learning effectiveness for nursing
students



FOUNDATIONS OF COGNITIVE LOAD THEORY

Intrinsic Cognitive load – complexity of the material

Extrinsic Cognitive load- unnecessary effort to process non-essential information

Germane Cognitive load – the mental effort to process and integrate novel information

Type of Load	Description	Impact on Learning
Intrinsic Load	Complexity inherent to the material	Depends on learner's prior knowledge
Extraneous Load	Caused by poor instructional design	Should be minimized
Germane Load	Mental effort for schema construction	Should be optimized

Introduction to Cognitive Load Theory (CLT)



IMPORTANCE OF CLT IN NURSING EDUCATION

Challenges in Nursing Education

Nursing education is content-heavy and exam-focused, leading to cognitive overload and reduced student motivation.

Cognitive Load Theory Overview

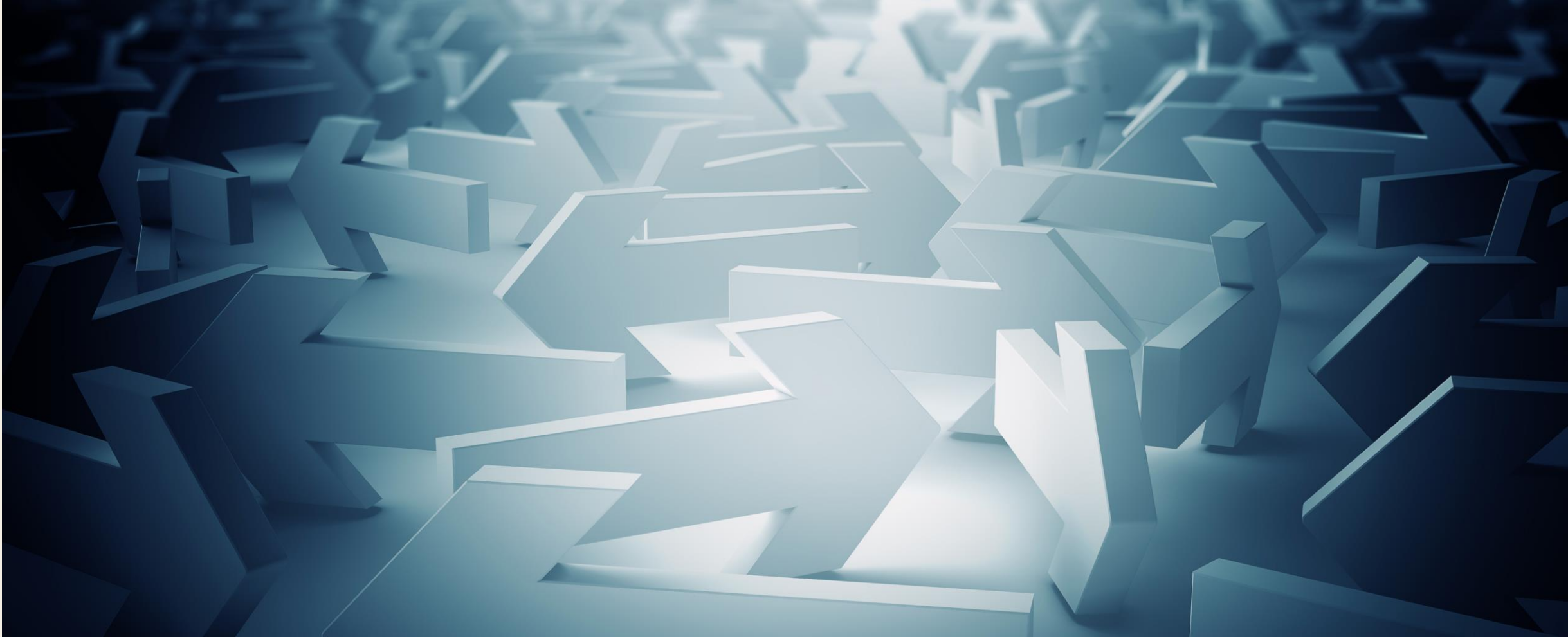
CLT guides educators to design instruction that matches learners' cognitive abilities by managing intrinsic, extraneous, and germane loads.

Application in Pharmacology Training

CLT principles help students process complex pharmacology information effectively for real-world clinical judgment.

Enhancing Student Motivation

Implementing CLT fosters student-centered learning, improving motivation and active engagement in nursing education.



INSTRUCTIONAL STRATEGIES BASED ON CLT

Teaching Intentionally and Organized to maximal impact.

FOUR KEY STRATEGIES FOR REDUCING COGNITIVE LOAD

STRATEGY	DESCRIPTION	CLT LOAD ADDRESSED
Opening Review Activities	Activates prior knowledge	Manages Intrinsic Load
Providing Lecture Notes	Reduces need for transcription	Minimizes Extraneous Load
Top Five Prototype Approach	Focuses on key concepts	Optimizes Germane Load
Need to Knows vs. Nice to Knows	Prioritizes essential content	Reduces Extraneous Load



DESIGN PRINCIPLES FOR MANAGING LOAD

Reducing Extraneous Load

Use goal-free tasks, worked examples, and integrate multiple information sources to minimize unnecessary cognitive processing.

Managing Intrinsic Load

Sequence tasks from simple to complex and gradually increase fidelity to build foundational knowledge effectively.

Optimizing Germane Load

Increase task variability, apply contextual interference, and encourage self-explanation to promote deeper learning.

Promote Positivity

People can problem-solve and gain insights when in a positive mood. (Subramaniam et al., 2009)

Expertise Reversal Effect

Tailor instruction to learner expertise; guided help for novices and complex tasks for experienced learners.



STUDENT MOTIVATION AND LEARNING ENVIRONMENT

Students still need to be motivated to learn

When bogged down with extraneous information, motivation may fail.

Our students care about caring for people; let's not burn them out.

CHALLENGES FACED BY NURSING STUDENTS

Academic Pressure and Stress

Heavy curricula and high-stakes exams cause stress and disengagement among nursing students.

Cognitive Overload Effects

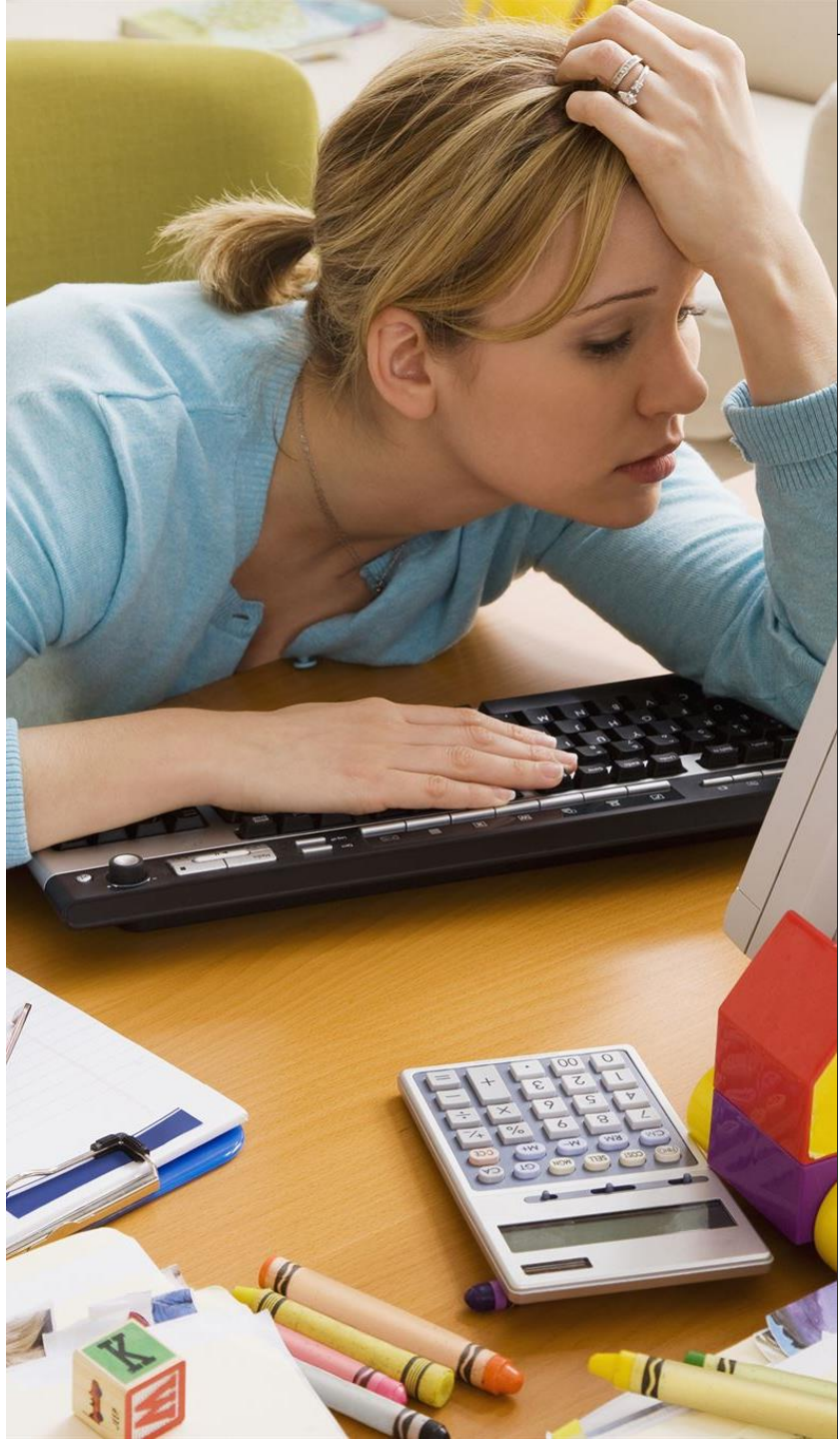
Cognitive overload hinders students' ability to process and retain critical information effectively.

Diminished Motivation

Performance focus shifts students from intrinsic motivation to rote memorization and test performance.

Need for Supportive Education

Educators must create cognitively manageable and emotionally supportive learning environments for nursing students.





EDUCATOR STRATEGIES FOR POSITIVE MOTIVATION

Student-Centered Learning

Creating a student-centered environment emphasizes autonomy and personal motivation to enhance engagement.

CLT-Based Instructional Strategies

Simplifying content delivery and emphasizing core concepts helps manage cognitive load and improve understanding.

Clear Goals and Feedback

Providing clear learning goals and timely feedback motivates students and supports self-reflection.

Emotional and Cognitive Support

Acknowledging challenges and offering mentorship and flexible learning fosters resilience and confidence.



CONCLUSION AND IMPLICATIONS

Students have a limited ability to gain knowledge. Instruction must be intentionally well-designed to reduce extraneous information and encourage student understanding.



SUMMARY OF KEY INSIGHTS

Cognitive Load Theory Framework

CLT helps optimize nursing education by addressing learners' cognitive limits and instructional design.

Instructional Strategies by Kaylor

Strategies like review activities and lecture notes reduce overload and promote active learning.

Design Principles for Task Management

Manage cognitive load using structured task sequencing.

Emotional and Motivational Support

Supporting emotional and motivational needs improves nursing students' learning and reduces stress.

REFERENCES

- Fiveable. (2024a, July 31). Intrinsic Load – Cognitive Psychology. <https://fiveable.me/key-terms/cognitive-psychology/intrinsic-load>
- Fiveable. (2024b, July 31). Extraneous Load – Cognitive Psychology. <https://fiveable.me/key-terms/cognitive-psychology/extraneous-load>
- Fiveable. (2024c, July 31). Germane load – Cognitive Psychology. <https://fiveable.me/key-terms/cognitive-psychology/germane-load>
- Kaylor S. K. (2014). Preventing information overload: cognitive load theory as an instructional framework for teaching pharmacology. *The Journal of Nursing Education*, 53(2), 108–111. <https://doi.org/10.3928/01484834-20140122-03>
- Subramaniam, K., Kounios, J., Parrish, T. B., & Jung-Beeman, M. (2009). A brain mechanism for facilitation of insight by positive affect. *Journal of Cognitive Neuroscience*, 21(3), 415–432. <https://doi.org/10.1162/jocn.2009.21057>
- Sweller, J. (2011). Cognitive Load Theory. In *Psychology of Learning and Motivation*, Academic Press 55. 37-76. <https://doi.org/10.1016/B978-0-12-387691-1.00002-8>.
- vanMerriënboer, J. J. G. & Sweller, J. (2005). Cognitive Load Theory and complex learning: Recent developments and future directions. *Educational Psychology Review* 17(2). 147-177. <https://doi.org/10.1007/s10648-005-3951-0>

