

# What does gravity, density and waves have to do with Pharmacy Education?

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# INTRODUCTION & BACKGROUND

## PhD study

### Methodology

- \* Case Study – Pharmacy Education (B. Pharm) UKZN
- \* Participants: Pharmacy Academics
- \* Academic years: 3 & 4
- \* Pharmacology, Pharmaceutics, Pharmaceutical Chemistry & Pharmacy Care
- \* Pharmacy through an educational lense –Legitimation Code Theory (LCT) and semantics

# GRAVITY, DENSITY & WAVES

**Semantic gravity:** degree to which meanings are bound to their context

**SG+**

**SG-**

**Semantic density:** degree to which meanings are concentrated within words, terms, phrases, symbols etc.

**SD+**

**SD-**

**Semantic waves:**

**SG-SD+**

**SG+ SD-**

# HOW WORDS BECOME WAVES

*And when you hear the word histamine and anti-histamine, you know, you immediately think of allergic reactions (Z/L/p1p3L3)*

Pharmacology

Greater Abstraction

SG-SD+

Unpacking process

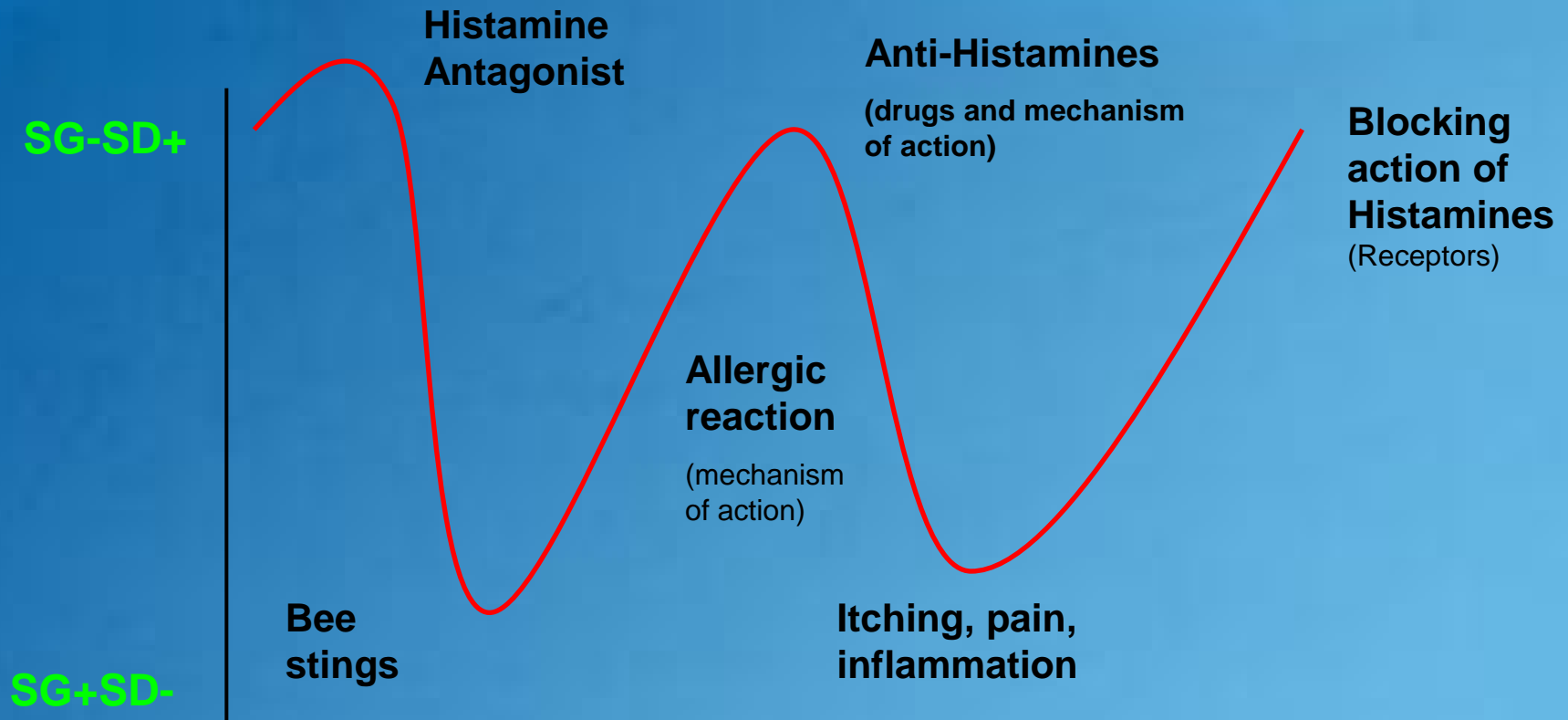
Re-packing process

SG+SD-

Concrete and Context

*Anti-histamines are actually histamine receptor antagonists, meaning drugs that block the histamine receptor. But we will talk about anti-histamine as a drug that opposes the action of histamine (Z/L/p1p3L15)*

# SEMANTIC WAVES IN PHARMACY



*When you look at the mechanism of action, histamine binds to a histamine receptor so how do you stop this. You just stop histamine from binding to a histamine receptor, meaning you get a histamine receptor antagonist and that is called anti-histamine. Ok! So now for pain, inflammation, itching the histamine receptor of importance is the histamine 1 receptor so that's the one you have to remember now. Antihistamines block your histamine 1 receptor (Z/L/p2p2L1).*

# MOTIONS OF THE WAVE: UNPACKING & REPACKING

## Downward curves

- \* Unpacking
- \* From highly condensed and the decontextualised concepts using 'everyday' examples'
- \* Unpacking density is 'not to negatively evaluate such activity' (Maton, 2013)
- \* Purpose: to provide a point of entry for noviciates into those meanings.
- \* Starting point for progressively strengthening its semantic density through elaborating, extending and refining additional meanings (Maton, 2013, p.15)

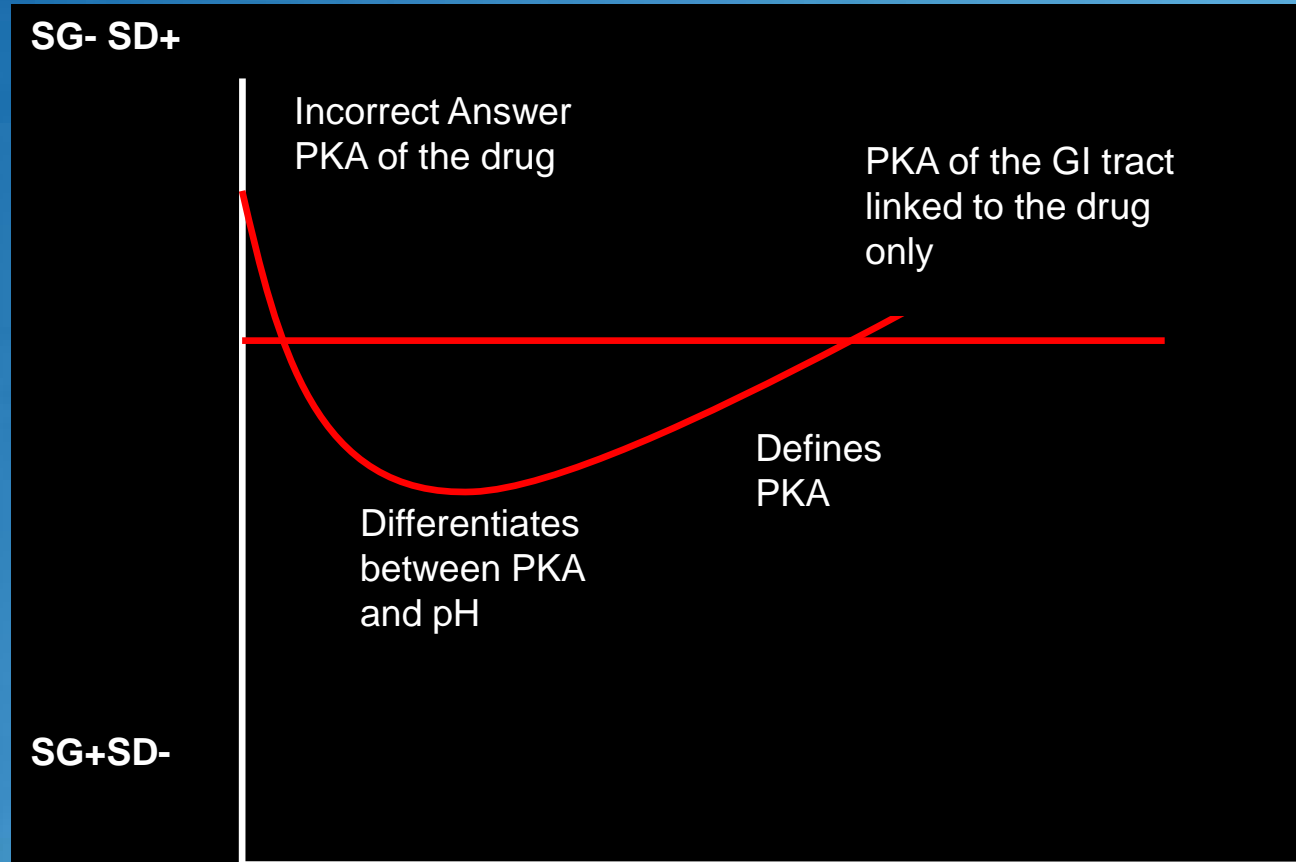
## Upward curves

- \* Repacking
- \* From decontextualised concepts towards greater levels of abstraction



# PATTERNS OF WAVES

Pharmaceutics  
Test Revision



# More Waves

## Pharmacy Care

SG-SD+

**Scientific and medical terminology**  
(pathology, etiology), causes of diseases,  
incubation, stages of diseases)

**Describing the  
medical condition**  
(lesions, wounds or  
contagious diseases)

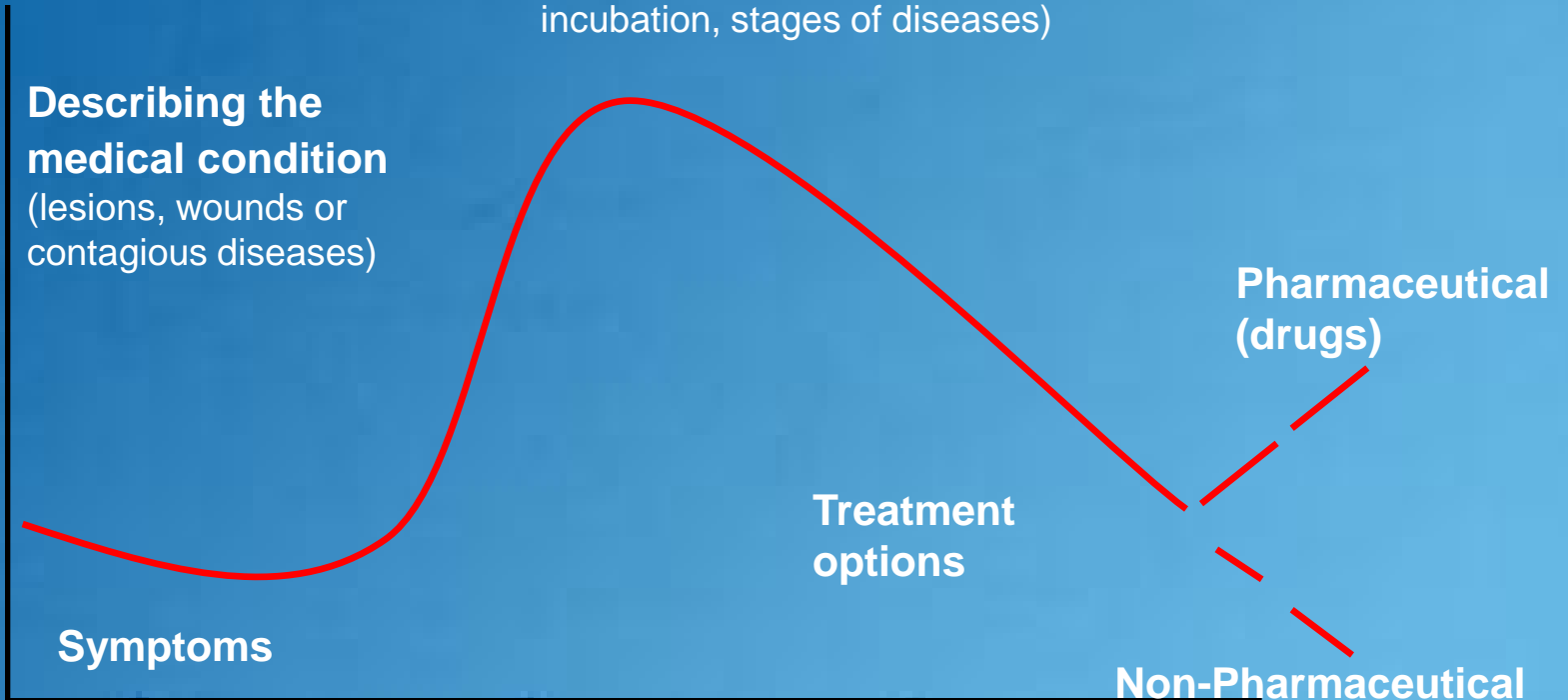
SG+SD-

Symptoms

Treatment  
options

Pharmaceutical  
(drugs)

Non-Pharmaceutical  
(diet & exercise)





# PATTERNS OF WAVES

- Waves differ between academic years 3 & 4
- Differ between academic components: lectures, tutorials, practicals
- Not all waves follow the pattern of high low high – implications for teaching & learning if waves are confined to high or low with no movement between
- Freebody *et al.* (2008) describes strong semantic gravity as resulting in knowledge that is confined or ‘weighted down’ in its pedagogic context, preventing transfer from taking place.
- Waves dependent on the academic level and discipline

# WHY ARE WAVES IMPORTANT

- \* Research suggests that key characteristics of knowledge building and achievement are semantic waves (Maton, 2014) - characterised by recurrent movement in context-dependence and condensation of meaning)
- \* Different knowledges are structured and acquired differently - implications for curriculum development, pedagogy and assessment (Freebody *et al.* 2008, Maton 2013 and Clarence, 2014)
- \* So, its not one kind of knowledge but rather mastery of how different knowledges are brought together and changed through semantic waves
- \* Blackie (2014) -As academics we help students to reach abstraction but need to keep dipping back so students begin to form mental associations
- \* Within profession qualifications, it is more than just an issue of acquiring knowledge and skills but extends to how students become part of a disciplinary or professional field or community (knowledge and knowers)

## CONCLUDING REMARKS

- The concepts of semantic gravity, density and waves provides an analytic tool for understanding underlying knowledge structures, changes and pedagogical practices (across disciplines and any topic).
- Semantic waves are viewed as the key to unlocking cumulative learning and to progression- implications for both teaching and learning, not only in Pharmacy but within Higher Education in general.

# REFERENCES

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**THANK YOU**

