THE EFFORT MODELS and GRAVITATIONAL MODEL

Clarifications and update

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Why this presentation?

The Effort Models (EMs) have been around for over 40 years What was a humble personal construct turned out to be very popular, but its nature is often misrepresented and misunderstood.

This presentation is offered:

- To **update** people interested in the Effort Models (EMs) on developments - To help **dispel misconceptions**

It is periodically updated but is not meant to replace full papers on the same topic

For more comprehensive information on the EMs and on their uses:

- Gile, Daniel. 2009. *Basic Concepts and Models for Interpreter and Translator Training* (revised edition). Amsterdam/Philadelphia: John Benjamins.
- Gile, Daniel. 2020. Forty years of Effort Models of Interpreting. Looking back, looking ahead.
 - https://www.researchgate.net/publication/344427247_Forty_years_of_Effort_Models_of_I nterpreting looking back looking ahead
- Gile, Daniel. 2021. The Effort Models of Interpreting as a Didactic Construct. In Muñoz Martín, Ricardo; SUN, Sanjun & LI, Defeng (eds). *Advances in Cognitive Translation Studies*. Singapore: Springer Nature. 139-160.

A few fundamental reminders about the nature of the EMs

These fundamentals are also discussed further later in this PPT

The Effort Models (EMs) and associated constructs are a conceptual framework, not a theory per se.

Their ambitions are explanatory, not predictive.

They mainly target interpreting students and interpreter trainers

They seek to offer **easily understandable** and **plausible** explanations of **the students' and practitioners' experience**, though they were also found to help investigators progress towards hypotheses and theories with predictive ambitions.

The EMs' focus is on cognitive economics (supply, demand and management of cognitive effort), but the directions and aims of the interpreters' efforts are determined by social norms (including professional norms) and social forces, including forces acting in local contexts and not necessarily in line with general social norms.

In particular, Errors, Omissions and Infelicities (EOIs) are thus determined intersubjectively, not by fixed, objective standards. Shifts in the informational content of the output when compared to the source speech are not considered incorrect by definition. As a matter of fact, they are often considered desirable.

The EMs and associated constructs offer cognitive analyses of interpreting performance measured against socially determined behavioral aims.

The Effort Models: What for?

As a student of conference interpreting, and later as a practitioner, teacher and researcher, I noticed:

- Language quality deteriorations in students' performance in class
 (Gile 1987. Les exercices d'interprétation et la dégradation du français : une étude de cas.
 Meta 32:4. 420-428)
- Marked *fluctuations in other aspects of students' performance* throughout the training period
- Numerous errors, omissions and infelicities (EOIs) in target speeches of experienced interpreters (documented in many papers in the literature)

Interpretive Theory, which dominated at the time, did not offer satisfactory explanations for these unsettling phenomena, and I tried to go a bit further

Wished to **understand the reasons**As a trainer, I wished to **help students** with suggestions if possible

The *Effort Models* and *Gravitational Model*, as well as the *Tightrope Hypothesis*, are the main resulting (*primarily didactic*) constructs

They were **not designed as research tools**, though they turned out to be considered useful by theoreticians and empirical researchers as well

Historical background (1) – Early 1980s

Intuitive, introspection-based conceptual structuring of simultaneous interpreting as as set of (behavioral) 'Efforts' (called Efforts because they were perceived as effortful)

easily identifiable as distinct albeit not necessarily independent 'functions' by students and trainers

- LA Listening and Analysis (of source speech) henceforth **Rec** (**Reception**) to account for interpreting from signed languages and for the visual component of reception (visual image of the speaker, information on screen etc.)
- M (Short-Term) Memory Effort (not based on psychological construct of Working Memory though strongly related to this construct see explanations later)
- P Production (of target speech), including self-monitoring

All competing for limited processing capacity (also called 'attentional resources')

$$Sim = Rec + M + P \le A$$

A: Available processing capacity

Note: the mathematical notation is used very loosely, by convention

Why is there no 'Translation'/'Conversion' Effort in the EMs? (1)

It is generally accepted by interpreters that good interpreting *relies mostly* on the reformulation of 'messages' on the basis of perceived meaning and intentions as represented mentally in a substantially 'deverbalized' form, (as stressed by the 'Paris School' – e.g. Seleskovitch & Lederer)

Interpreting *also* involves a substantial amount of 'transcoding', i.e. language-to-language conversion as regards names, technical terms, numbers, some formulaic language components etc., which

are most efficient when based on repeated associations in context between source-language words/names/collocations and target-language 'equivalents'

Such 'trans-linguistic equivalences' can play an important role in alleviating cognitive pressure because of their automatic or near-automatic nature (see relevant slides later in this presentation)

Why do the EMs not include this 'Translation' or 'Conversion' Effort?

Why is there no 'Translation'/'Conversion' Effort in the EMs? (2)

One reason is *didactic*:

Having adopted the view of Interpretive Theory (the "Paris School") that interpreting is performed best when it relies on analysis, mental representation and reformulation of the mental representation, not linguistic transcoding,

I wished to avoid giving too much salience to this interpreting pathway

Second reason:

transcoding can be conceptualized as part of Production,

saw no need to make a distinction in the models between meaning-based production and language-equivalences-based production

especially since the EMs focus on cognitive load and effort...

('Cognitive load' roughly referring to the amount of effort required to perform a cognitive task, and 'cognitive effort' to the effort actually invested in performing the task-see Gile and Lei, 2020)

... and such transcoding ends up being quasi-automatic, and thus requires virtually no attentional resources

Had the EMs been *designed* as cognitive models for research into interpreting cognition, transcoding would have been part of them

Historical background (2) – Automatic and controlled operations

Soon after constructing intuitively the basic structure of the Effort Models, I started exploring cognitive psychology and psycholinguistics literature,

and found out about the existence of a classification:

- Automatic operations

Require (virtually) no attentional resources, very fast

- *Controlled* operations

Require attentional resources, much slower

Also, that controlled operations become gradually 'automated' when repeated

Also found out that cognitive psychologists believe that enlistable attentional resources ('processing capacity) are limited at any time

and that a 'coordination' function (a set of 'executive' functions), which also uses up attentional resources, is important when managing cognitive activities

This resonated with the observed need in the booth to deliberately direct more or less attention to an Effort (e.g. listening, or production, or note-taking) to make sure enough resources were enlisted to perform a task without jeopardizing another

Added the *Coordination Effort C* to the Model *in reference to this need*

Historical Background (3) – Is interpreting 'automatic'?

Tested my intuitive construct's fit with *knowledge from cognitive psychology*: are listening and analysis, short-term storage and retrieval of information from memory, speech production controlled or automatic?

Outcome:

Contrary to a commonly held belief in the interpreting community at the time regarding A languages

each has controlled components

This idea was already well-established among psycholinguists at the time

Which meant that the intuitive construct made (general) sense in terms of cognitive psychological thinking

$$SIM = Rec + M + P + C$$

$$Requ(SIM) = Requ(Rec) + Requ(M) + Requ(P) + Requ(C) \rightarrow TOTAL Requ$$

Requ stands for attentional resource requirements

The + signs do not mean arithmetic addition, but some additive effect

Conditions for successful simultaneous

1. Sufficient available attentional resources/PC (Overall condition)

At any time:

$$Requ(Rec) + Requ(M) + Requ(P) + Requ(C) \rightarrow Total Requ \leq Total Available$$

(Total available PC is sufficient to cover the 'sum' of needs)

2. PC management condition (Interpreter's tactics and strategies)

At any time:

 $Requ(Rec) \le RecA$

 $Requ(M) \leq MA$

 $Requ(P) \leq PA$

 $Requ(C) \le CA$

Note: total availability of (enlistable) resources varies, and depends inter alia on *motivation*.

In some cases, it cannot be ruled out that if interpreters really tried hard, they would be able to enlist enough attentional resources to perform an Effort successfully (also see explanations of the Tightrope Hypothesis)

See for instance retrospective comments in E. Gumul's work

If at least one of the conditions is not met

One/several Efforts cannot perform adequately, which can lead to:

- Incomplete/incorrect comprehension of the source speech and/or
 - Incorrect/clumsy target speech and/or
 - Incomplete/incorrect storage/retrieval of information from short-term memory and/or
- Slowing down of one or several Efforts' performance and chain reactions

All of these can result in Errors, Omissions and/or Infelicities (EOIs)

Infelicities: clumsy language, not quite incorrect

An important point:

EOIs are defined intersubjectively, as shifts from the content of the source speech (and from language usage norms) which interpreters believe are not justified

Those shifts which they consider justified are not included in the count

The Tightrope Hypothesis (1)

What makes this analysis useful is the associated *Tightrope Hypothesis*:

Interpreters tend to work *close enough to cognitive saturation* for *many EOIs* to occur:

not because of the interpreters' insufficient knowledge of the working languages or topics,
not because of insufficient technical skills

but because

Attentional resources required to perform adequately were not available for a particular comprehension, memory storage or retrieval or production task at a time when they were needed

This includes cases where the interpreters might have found the resources if they tried hard, but gave up trying (disengagement from effort)

Motivation, conscientiousness, resilience come into play

The Tightrope hypothesis (2)

Tightrope hypothesis: "Interpreters tend to work close to saturation"

The nature of this hypothesis is sometimes *misunderstood*It was formulated as *holistic* and *intuitive*, in the same mindset as the EMs.
It was not designed for explorations of cognitive architectures and interactions.
And it *makes no quantitative claim* as to *how close* to saturation interpreters are

"No empirical support for the Tightrope Hypothesis"? Not true

- Massive anecdotal evidence
- *Empirical evidence to support it* as a *general* explanation of EOIs e.g. Gile, 1999 in *Hermes* with replications by Matisiak, 2001; Wallmach, 2004; Barsan, 2012; Mankauskienė, 2018; Gile, 2011; SHAO and CHAI, 2020, Tayebi, 2025.
 - *Many studies on problem triggers*, the effect of pause lengthening on EOIs (Barranco-Droege, 2015), brain imaging (Koshkin et al., 2018; Gumul, 2018; Zachová, 2019; YAN et al., 2024 see *CIRIN Bulletins* at https://cirin-gile.fr
- No alternative explanation offered for the large number of EOIs observed in the field

But there is definitively insufficient empirical testing and evidence to explore it further with respect to what exactly is saturated, when and how, what modules/components in a particular cognitive theory/architecture are affected and how.

Other EMs: Consecutive Interpreting

('long' consecutive interpreting with notes)

Comprehension phase: Rec + M + NP + C

NP: Note Production

Reformulation phase: NR + SR + P + C

NR: Note Reading SR: Speech Reconstruction from Memory

Strong cognitive pressure during the comprehension phase
Because of cognitive and mechanical aspects of note-taking during comprehension

Less cognitive pressure during the reformulation phase

Actually, during reformulation, there is *cognitive cooperation* between Efforts (the additive relation of attentional requirements is lowered or even reversed), as opposed to competition during the comprehension phase.

Comprehension phase is at the source of most EOs not of Infelicities

So note-taking is important

Other EMs: Sight Translation

Sight Translation

Read + M + P + C

Read: Reading Effort

At first sight,
Sight Translation seems easier than simultaneous or consecutive because the information is there to see at any time,
but

P is particularly difficult in sight translation because of the permanent visual presence of the ST and the resulting risk of linguistic interference from the source language

On balance, it seems to be *just as difficult*, at least for beginners who have not yet mastered the skill of mentally taking some distance from linguistic forms and retaining a highly 'deverbalized' mental representation of what they say

Other EMs: Simultaneous with text

Speakers are reading a text, and interpreters are listening to them and reading when interpreting

$$L + Read + M + P + C$$

L: Listening Effort Read: Reading Effort

Interpreter can be *helped* by text e.g. numbers, names, restructuring or particular translations are required Especially if time for preparation

But there is **one more Effort to coordinate** (reading) and speeches are often dense, read rapidly Speakers may also deviate from their written text

Sometimes easier than simultaneous without text, for instance when the speaker has a strong accent or when the speech contains many names and numbers

Sometimes more difficult
Especially when the speaker deviates often from the text

Too much attention devoted to reading takes away attention from listening Appropriate *coordination* is particularly *important*

Simultaneous with text vs. 'simultaneous'

Nowadays, in many interpreting assignments, speakers use PowerPoint presentations and other images and texts on screen

Does the distinction between 'simultaneous' and 'simultaneous with text' still make sense?

In simultaneous with text, the speaker reads out the speech from a text, which the interpreter has in the booth

In ordinary simultaneous ('without text'), only a *small proportion of the speech* corresponds to written text (on screen) which is read out

It makes sense to maintain the distinction,

while drawing the students' attention to the possibility of some parts of speeches 'without text' being very similar to speeches 'with text'

Other EMs: Simultaneous with highly embedded technology

Simultaneous with highly embedded technology includes:

- Remote Simultaneous Interpreting
 Simultaneous interpreting with CAI tools
 Simultaneous interpreting with augmented reality
- In all these cases, some attention is required to
 take in and analyze data (e.g., visual information from automatic transcripts and translation candidates, written messages from remote boothmates, language and microphone on/off controls, especially during handover see Matsushita et al. 2025)

- manipulate controls and/or keyboards (e.g., when writing a query or a message to a remote boothmate)

This involves a distinct Effort, the *Human-Machine Interaction Effort – HMI*

Simultaneous with highly embedded technology:

$$Rec + M + P + C + HMI$$

Other EMs: Simultaneous from a spoken language into a signed language

$$Sim = Rec + M + P + SMS + OID + C$$

SMS: Self-Management in Space OID: Online Interaction with the Deaf

SMS: Spatial positioning, distance to the speaker, angles to optimize comprehension of the source speech and transmission to Deaf users of the Target speech

OID: Attending to the signing by Deaf users of the Target speech, some of which is 'internal' and some of which is addressed to the interpreter

see for instance **Bélanger** 1995/2015, **Pointurier-Pournin** 2014 and **Del Vecchio**, **Cadarelli**, **De Simone**, **Petitta**. 2015. Interacting with Participants Outside of Interpretation. In **Nicodemus**, **Brenda & Keith Cagle** (eds). 2015. Signed Language Interpretation and Translation Research. Selected Papers from the First International Symposium. Washington, DC.: Gallaudet University Press. 24-48.

*The EM for simultaneous in signed language interpreting was adapted into somewhat different models by a number of signed language interpreters over the years. The Model presented here is largely based on the work done with/by **Sophie Pointurier-Pournin**. 2014.

L'interprétation en Langue des Signes Française: contraintes, tactiques, efforts.

Unpublished doctoral dissertation, Université Paris 3 Sorbonne Nouvelle.

Other EMs: SL Interpreting in 'feed mode' – the HIDIM Effort (1)

In signed language interpreting, in the 'feed mode', a spoken language speaker is interpreted into sign language by a hearing interpreter, who *feeds* his/her output to a Deaf interpreter who reformulates the speech in sign language for the Deaf audience – *this also works in the other direction*.

In such configurations, besides the content of the main speech (that of the speaker being interpreted),

there is much signing of indications from one interpreter to the other designed to optimize the teamwork:

A distinct stream of "metacommunication" (Fontvieille, 2022)

(e.g. validation, correction, meaning negotiations, requests to repeat a segment or interpret the next segment)

The process is described in the signed language interpreting literature.

I was made aware of it through

Fontvieille, Vivien. 2022. La métacommunication entre les interprètes dans les situations de "feeding": ressources, contraintes et efforts. MA thesis, Université Toulouse – Jean Jaurès, reviewed in CIRIN Bulletin n. 65

Other EMs: SL Interpreting in 'feed mode'- The HIDIM Effort (2)

This requires much upstream preparation

Plus constant attention of each team member to the other team member's signing and metacommunication

Fontvieille suggests that this might justify the addition of a new Effort for this mode.

I think the idea makes sense (see next slide) and have added this new Effort under the name:

HIDIM: Hearing-Interpreter-Deaf-Interpreter-Metacommunication Effort

But will let signed language interpreters make suggestions on how it should be included in an overall model of SLI in the feed mode

Further developments: High social/psychological stakes/pressure situations – The Human and Social Consideration Effort

If interpreters need to constantly pay attention to what role they should play in a particularly sensitive mediated face-to-face interaction and what reformulation decisions are most appropriate psychologically and socially (e.g. some situations in community interpreting, diplomatic/political interpreting)

SI:
$$Rec + M + P + C + HSC$$

HSC: Human and social considerations Effort*

https://www.researchgate.net/publication/344427247 Forty years of Effort Mo

dels_of_Interpreting_looking_back_looking_ahead, and in Gile, Daniel. 2021. The Effort Models of Interpreting as a Didactic Construct. In Muñoz Martín, Ricardo; SUN, Sanjun & LI, Defeng (eds). Advances in Cognitive Translation Studies. Singapore:

Springer Nature. 139-160.)

^{*(}First mentioned in the September 2020 update of this PowerPoint presentation, in Gile, Daniel. 2020. Forty years of Effort Models of Interpreting. Looking back, looking ahead.

Explaining performance problems with the Effort Models

These explanations were the first practical use of the construct offered to students and accounted for widely shared knowledge among practitioners and trainers

Problems are most likely to occur:

1. When PC requirements increase

- Speech density
- Noise, Signal distortion (including unusual accent, prosody, grammar)
- Short-term memory overload (e.g. restructuring of information order required)

2. When mismanagement of attention

- Too much or too little attention attributed to an Effort
 - EVS too long or too short
- Sub-optimal tactic selection resulting in cognitive interference
 - Sub-optimal note-taking in consecutive

3. In vulnerable segments

Short words, numbers, homophones

The gravitational model of language availability: Initial awareness

Plain 'knowledge' of words, rules of grammar etc.? Is there another relevant/important dimension to language mastery?

- Sometimes you 'know' a word, but *have difficulty retrieving it from memory*, or 'know' a rule of grammar, style etc., but it takes some time and effort to apply it ('tip of the tongue' phenomenon)
- Sometimes you understand a foreign language when it is spoken slowly, but not when it is spoken faster

I referred to the time it takes to find/understand a word/linguistic structure (which is assumed to be correlated with the 'effort' this requires) as

'Language availability': The (conceptual) variable which measures this time/effort

Effects of low availability

On production

Low availability slows down production: Mostly hesitation pauses, perhaps lengthening of syllables

Not a major problem in everyday conversation Not necessarily problematic in consecutive

Highly problematic in simultaneous

because

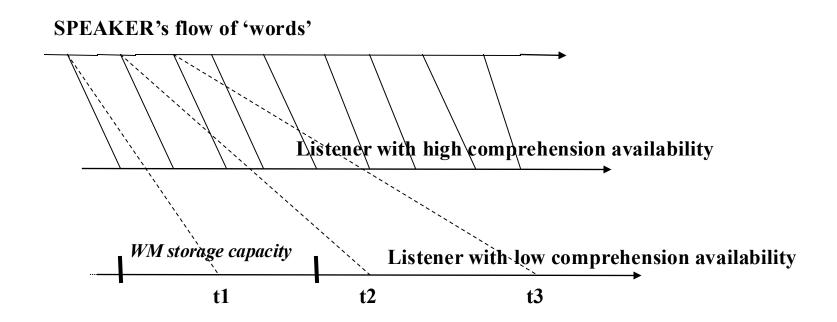
If speech production is too slow
Interpreter lags behind speaker
Needs to store too much information in short term/working memory
and ultimately "loses" information because of saturation

On comprehension

Low availability lows down processing of incoming speech signal Major problem in both consecutive and simultaneous *Can result in non-comprehension*

When WM is saturated

Illustration in next slide



Schematically:

At t1, high availability listener has finished processing the content of more than 2 words and keeps the content of one in WM – low availability listener has finished processing the content of 1 word

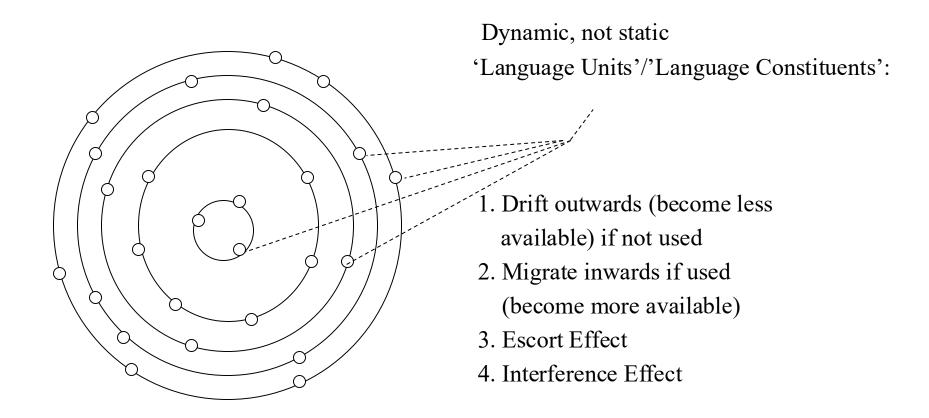
At t2, speaker is uttering 7th word, high availability listener has finished processing the content of 6 words – low availability listener has finished processing 2 words, and must keep the content of 5 words in WM.

At t3, WM of low availability listener is probably saturated

A GRAVITATIONAL MODEL OF LANGUAGE AVAILABILITY

A visual representation of availability of 'language units'/'language constituents'

By convention: the closer to center, the more available



A single visual representation for many 'systems'/states of availability

If tried to map a person's state of availability for any language:

There can be **differences from one minute to the next**(for instance when a newly acquired technical term – or sign in a sign language – has just been used several times)

The map would be **different**:

- For **production** (one's idiolect) vs. **comprehension** (other speakers of the same language's idiolects and sociolects),
- For written vs. spoken language
- In sign languages, for reading vs. producing fingerspelling etc.

The single map with concentric circles is a gross simplification Only used for visual, intuitive support

A reminder:

Like the EMs, the Gravitational Model is a holistic representation of processes (believed to be) observed in the field and in line with ideas formulated in the psycholinguistic literature. It makes no quantitative claims as regards the amplitude and speed of availability changes and their effects

A 'trans-linguistic correspondences' gravitational model

The gravitational model can be used to map availability of production/comprehension in single languages, but also

To map the availability of trans-linguistic correspondences i.e. SL-TL correspondences

Essentially for lexical units (terms, names) and set phrases (idioms, greetings, etc.)
But also for formulaic language (collocations, clauses)

The existence of such highly available correspondences can be assumed to reduce markedly PC requirements for Production

The fundamental laws of:

- lower availability when rarely used (outward migration)
- higher availability when used frequently (inward migration)

apply as they apply to the single language mappings

Conceptual uses of the Effort Models and Gravitational Model (1)

These Models have been widely used in the literature $-inter\ alia$ – to:

- *Explain recurrent difficulties* in interpreting Including errors, omissions and infelicities affecting 'easy' speech segments
- *Discuss tactics* (decisions with immediate goals) and *strategies* (decisions with less immediate goals, including preparation of conferences and working on one's language availability) see Gile 2009

Note that tactics have *expected gains and losses* (informational, social, linguistic, cognitive). Risk-management is an intrinsic part of the probabilistic weighing of gains and losses as the basis of tactical decision-making.

- Discuss language specificity in interpreting
- Discuss directionality
- Discuss learning processes and methods
- Discuss the relative difficulty of various modes of interpreting

Conceptual uses of the Effort Models and Gravitational Model (2)

- Discuss note-taking options, including language choices and symbols
- Discuss students' evolution over time (sometimes referred to as 'expertise')
- In research: Generate hypotheses for empirical research, explain empirical findings, serve as a basis for further theorizing

The Effort Models and cognitive psychology (1)

A reminder: the EMs were constructed on the basis of introspection + a few general concepts from cognitive psychology

They are not a cognitive theory about:

- Processes and/or cognitive architectures
- Working Memory
- Executive Functions
- depth/stages of processing during comprehension
- 'direct', 'automatic' trans-linguistic correspondences vs. conceptual mediation
- the existence of a single pool of attentional resources vs. distinct pools

What the EMs say:

for the purpose of

- explaining many recurrent phenomena in interpreting
- discussing strategies and tactics, including didactic and professional options,

it is **useful** to think of interpreting as comprising functional 'Efforts' which compete with each other in terms of available' processing capacity

The Effort Models and cognitive psychology (2)

M (Short Term Memory Effort) is not the same as Working Memory (WM)

WM is part of all Efforts, including the Reception Effort and of the Production Effort.

It would therefore not make sense to postulate a distinct WM Effort.

M corresponds to a functional, behavioral view often with tactical/strategic components (e.g., should the interpreter wait or not?) though once information is selected for storage or retrieval, WM comes in centrally.

C (the Coordination Effort) looks similar to the cognitive psychologists' executive functions, which direct and control attention, but in view of the EMs essentially didactic aims, I prefer to keep the Coordination Effort C as a holistic function that students and practitioners identify easily and avoid locking it to a more complex psychological construct which is being investigated by cognitive scientists

The Effort Models and cognitive psychology (3)

More generally the Models were *designed for the classroom*In relative independence of new cognitive theories and models as long as

developments *do not contradict its basic assumptions* – which is the case to the best of my knowledge:

- the (overall) *non-automaticity* of the Efforts
- the *finite* nature of human attentional resources
- the ability of humans to *allocate* at least part of their attention to specific tasks
- the *competition* between Efforts for available attentional resources even if some also draw on distinct pools besides a common pool (e.g. de Groot, 2015)

But cognitive psychology and psycholinguistics remain fundamental reference disciplines for the Effort Models

Their input on human cognition is central to the control, validation and further development of EM-related hypotheses and theories

The social situatedness of the Effort Models (1)

An author, copied by others, has *claimed* that the EMs are cognitive only and *disregard human* (social and psychological) situations *Not tr*ue.

The Effort Models look at cognitive actions largely determined by social environments and functions

See Chapters 2, 3 and 8 (inter alia) of Basic Concepts and Models

Decisions on

- what information should be rendered in the target speech,
- with what priority and in what form (see example later),
- what information should be omitted,
- what *information should be added* (explanations, requests for clarification)

are based on communication situations, on ethical considerations and on codes of conduct

See the discussion of 'laws' underlying the selection of tactics in Chapter 8 of Basic Concepts:

Seeking maximum information recovery
 Seeking maximum effect in a certain direction
 Self-protection etc.

The social situatedness of the Effort Models (2)

Examples from signed language interpreting

Interpreters may decide they need to not only translate hearing speakers' speeches, but also report on the speakers and on events in the room for the benefit of Deaf users of their service – this has a cognitive cost, if only because of the time it takes and the associated risk of WM saturation (see Pointurier-Pournin 2014).

Interpreters may decide to reformulate a concept in an iconic way through 'scene setting' rather than fingerspell it, because they believe their Deaf clients will reject fingerspelling as an intrusion of the language of the Hearing, even if fingerspelling takes less time and has a lower cognitive cost.

The main focus of the EMs is cognitive, but other aspects of interpreting are not ignored

Stressing the importance of brushing one's teeth does not mean that one disregards the need to also wash one's hands etc.

Considering the future: When does it make sense to add new Efforts to the Models?

In the literature, some authors have suggested different versions of the Effort Models, generally with more Efforts

In Gile's view, on the basis of the 'philosophy' underlying the construction of his EMs, such additions are useful if the new Effort:

- 1. Is easy to distinguish from an existing Effort
- 2. Has non-negligible attentional requirements
- 3. Is likely to **facilitate the exploration** of attentional-requirements related interpreting phenomena, tactics and strategies

A few references (1)

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