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AUTHOR Allal, Linda
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ABSTRACT

A conceptual framework is presented for studying the processes of metacognitive regulation involved in complex learning activities such as text composition. A method is demonstrated for analyzing text transformations as a means of making inferences about underlying processes of regulation. Data are from a study of four female sixth graders in Switzerland (two high achievers and two medium achievers) writing informative texts for a school exhibit. The analysis focuses on transformations introduced by each subject as she passed from notes to the initial text draft. Transformations are such things as addition or deletion, replacement, or change of location of information in a text. Data show that subjects made minimal use of all types of transformations, but that higher achieving students do show greater mobility in deployment of these tools. Results suggest that high-achieving students vary the type of transformation to obtain a wide range of optional transformations, while middle-achieving students carry out relatively more conventional transformations using predominantly simple means. The study shows how the analysis of text transformations can be used to make inferences about the underlying operations of metacognitive regulation involved in writing. Two figures and three tables illustrate the study findings. (Contains 10 references.) (SLD)

Text transformations as an indicator of self-regulation in writing

Linda Allal
University of Geneva

This paper has two objectives. First, it will present a conceptual framework for studying the processes of metacognitive regulation involved in complex learning activities, such as text composition. Second, it will demonstrate a method for analyzing text transformations as a means for making inferences about underlying processes of regulation. The data were obtained in a study of sixth-grade students writing informative texts to be displayed in a school exhibit.[1]

Metacognitive regulations in writing

Self-regulation encompasses both cognitive regulations involved in the construction of conceptual knowledge and metacognitive regulations which allow management of cognitive resources while the subject is solving a problem or carrying out a task. Since only the second case is considered in this article, the term "self-regulation" will subsequently refer to metacognitive operations regulating on-going, task-oriented activity.

Research on metacognition, and in particular the work by Ann Brown and her colleagues (Brown, 1978; Brown 1987; Brown & Palinscar, 1982; Campione & Brown, 1990), has led us to define metacognitive regulation as an "interface" which assures the coordinated functioning of two other components of the subject's cognitive activity: his representational network of task-relevant concepts and of contextual factors, and the production processes mobilized to accomplish the task (Allal & Saada-Robert, 1992). Metacognitive regulations intervene both in the orientation of production processes in a manner compatible with the subject's representations,

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Author's address: Prof. L. Allal, Faculté de psychologie et des sciences de l'éducation, Bât. D, 9 rte. de Drize, 1227 Carouge, Switzerland

and in the adjustment of his representations to take into account the outcomes of production processes.

In terms inspired by information-processing theory, we have defined three operations of metacognitive regulation as follows:

1) *anticipation*: this operation reflects the transposition of the subject's representations into goal orientations, defined with varying degrees of precision and intentionality;

2) *monitoring*: this operation entails the comparison of the present state of advancement with respect to the task to an anticipated goal-state; in complex tasks, the comparison concerns multiple aspects of the present state and a multi-faceted goal-state;

3) *adjustment*: this operation aims at reducing the discrepancy between the present state and the goal-state. If the feedback from the monitoring operation is negative (i.e., the goal-state is not attained, or progress in that direction is unsatisfactory), an adjustment is introduced in the production processes. If feedback is positive, the production processes continue without reorientation, or cease because the goal is fully reached.

A more detailed description and discussion of each operation is provided in Allal & Saada-Robert, 1992.

These three operations can be situated on a continuum entailing at least four successive degrees of explicitness: *implicit* operations of which the subject has no awareness, *tacit* operations that can be made explicit if the subject is asked to do so, *explicit* operations of which he is consciously aware while working on the task, *instrumented* operations involving the use of external tools. For any moderately complex tasks which requires the coordination of several production processes, the regulation of some processes is essentially automatic (or with practice become automatized), whereas the regulation of other processes requires active, intentional cognitive resource management (Iran-Nejad, 1990; Allal & Saada-Robert, 1992).

The operations of metacognitive regulation are particularly important in writing activities which entail successive phases of planning, composition and revision of a text (Fayol, 1991). Experimental studies (Hayes, Flower, Schriven, Stratman & Carey, 1987) have led to more detailed models of the self-regulation mechanisms involved in text revision, while research with school-related tasks has

shown that appropriate instructional conditions can lead children to improve metacognitive strategies linked to writing (e.g. Bereiter & Scardamalia, 1987; Salomon, Perkins & Globerson, 1991).

Studies of self-regulation in writing rely frequently on methods of verbalization: "think-aloud" protocols recorded during the different phases of writing, interviews before and after each phase. An alternative approach, less subject to biases than verbalization, is to base inferences about processes of regulation on an analysis of the transformations introduced by a writer between successive versions of his text. This paper presents an exploratory study aimed at developing methods for studying these processes. The study entails comparisons of students with different levels of school achievement in order to understand the relationships that may exist between self-regulation and levels of expertise in writing.

Method

Instructional sequence

The writing sequence, carried out in a sixth-grade classroom, entailed several phases. As advocated in the language curriculum adopted by the Geneva school system (Pasquier & Dolz, 1990), the sequence began with two types of preparatory activities: 1) discussion regarding the exhibit's theme, purpose and expected public of visitors; 2) analysis of several examples of informative texts so as to help the students identify the general characteristics of the type of text they were going to produce. The children were then grouped into teams of four and a general theme was assigned to each group. Having defined four topics linked to the general theme, the group members each prepared a text on one topic; the four texts, with various accompanying illustrations, constituted the group's poster for the exhibit. A large number of reference books, brought by the teacher and the children from the school library or other sources, were placed on a resource table in the back of the classroom. Several class periods were available for each child to take notes on his topic from the reference material. On the basis of these notes (P1), each student then produced an initial draft of his text (P2). After discussion with the other group members, a final version of each text was prepared for the poster (P3).

Subjects

The research was conducted in a sixth-grade class (age 11-12 years) of an elementary school located in the urban center of Geneva canton. The students attending the school cannot be considered as representative of the general student population of the canton: not only are Swiss nationals slightly over-represented (65%, compared to 60% canton-wide), the percentage of children from high socioeconomic status families is more than the double of the canton percentage (47%, as compared to 20%). For the activity under study (production of texts), it can thus be assumed that our subjects are more at ease than is the case on the average in the canton. The teacher who volunteered to work with us and allowed us access to her class had recently completed a university degree in sciences of education.[1]

All class members participated in the writing sequence, but only four girls, assigned to a same group, were selected for analysis. In order to obtain data on subjects with contrasting achievement levels, as indicated by their first-trimester grades, we chose two "high-achieving" students with grades of 6 (highest grade on a six-point scale) in all subject matters, and two students with grade point averages of 3.8 and 4.2 respectively. The latter students, designated as "middle-achieving," had grades of 4 in "French basic skills" (spelling, grammar, conjugation), which is the minimum required for entry into the academic section of junior high school. It was decided from the outset not to study the students with the lowest achievement level since their lack of fluency in spoken French, or other problems, would have precluded their full implication in the writing activity. In the presentation of the results, the high-achieving subjects are identified as Eva and Fanny, and the middle-achieving subjects as Maude and Sonia (fictive names).

Data base

The transformations were carried out by the subjects using their notes (P1) as a basis for composing the initial draft of their text (P2). Each child wrote one to five pages of notes based on the reference books she consulted. Three of the children - Fanny, Maude and Sonia - consulted 8-9 sources and showed an approach to note-taking that is typical of many children of this age: instead of listing information in abbreviated form, their notes were written in paragraphs composed both of recopied passages from the references and of summaries in their own words. In other words, they tended to draft their text while taking their notes. Eva's approach reflected a

clearer understanding of the distinction between notes and text; she consulted a large number of sources (18 references) and produced notes in the form of a list of separate sentences, preceded by dashes.

The children's drafts of their texts (P2) varied in length from 179 to 261 words. (average length: 212 words). Each text, headed by a title, was divided into paragraphs (3-9) and contained subtitles (1-3). The time spent drafting the text varied from 18 to 35 minutes (average: 24 minutes).

Method of analysis

The analysis focuses on the *transformations* introduced by each subject as she passed from the notes she had taken (P1) to the initial draft of her text (P2). The transformation are classified on several dimensions and their relationships studied by quantitative analyses based on contingency tables. This analysis leads to inferences regarding the underlying operations of metacognitive regulation characteristic of all four subjects, as well as the aspects of these operations that differ between the high-achieving and middle-achieving students.

The method of analysis is designed to provide a precise classification, along five dimensions, of the transformations introduced between P1 and P2. The units of analysis are defined as all observable differences between P1 and P2. Each unit is identified and then coded according to the following category system.

Dimension	Code	Category
Level of language affected by the transformation	W	Word
	G	Group (group of words with a grammatical function within a sentence)
	S	Sentence
	T	Text
Formatting affected by the transformation	P	Punctuation
	F	Other formatting (paragraphs, sub-titles, underlining, etc.)
	none	Transformation does not concern formatting

Type of transformation	A	Addition
	D	Deletion
	R	Replacement
	T	Transfer (change of location in the text)
Object of the transformation	S	Spelling (conventional & grammatical rules)
	I	Information, semantic content
	O	Organization of discourse
	M	Minor adjustments (not entering in preceding categories)
Conventional/optional nature of the transformation	C	Transformation linked to the conventions (standards of correction) of written language:
	C+	- if a correct transformation is carried out
	C-	- if the transformation introduces an error
	Op	Optional transformation, not required by the conventional standards of written language

The coding of each dimension is completed by qualitative remarks that aid interpretation. A complete description of the coding rules appears in Appendix 1. The illustration in Figure 1 shows how the rules are applied to the beginning lines of one student's text. For example, the third unit of analysis (introduction of a capitol letter at the beginning of a sentence) is coded as a transformation affecting the sentence (S), introducing punctuation (P), carried out by replacement of a noncapital by a capital letter (R), having an impact on the organization of the text (O), and required by the conventions of written language (C+). In the case of the sixth transformation, a sentence that appeared in the 14th point of the notes has been moved to become the second sentence of the text; this transformation affects the text (T), is carried out by a transfer of location (T), concerns the organisation of the discourse (O) and is an optional change introduced by the author (Op).

Insert Figure 1 about here

The coding of the transformations was carried out separately by each member of our research team. An acceptable degree of inter-coder agreement was attained: an average of 83% for all five dimensions, with variations of 75% for object of transformation and level of language affected to 94% for formatting. The discrepant cases were resolved by discussion, which led to the introduction of

additional specifications in the coding rules.

The coded data were analyzed by means of a series of chi^2 tests. Tests of homogeneity were conducted crossing subjects with each coding dimension. For selected cases, data were combined for the two subjects with the same achievement status (high-achievement vs. middle-achievement), and status was crossed with the coding dimensions, as originally defined, or as regrouped on the basis of initial analyses. Tests of independence were carried out by crossing, for each subject, selected pairs of coding dimensions (in original or regrouped form). The results of the chi^2 tests were considered as significant at $p < .01$. Given the large number of tests carried out and the fact that data do not fully correspond to certain assumptions of the chi^2 model, our analysis needs to be considered as a systematic means of *exploring* relationships in the data in order to delineate hypotheses to be investigated further in subsequent research.

Results

The presentation of the results is organized as follows. For each of four dimensions of tranformation[2], the relevant analyses are examined. Differences between high-achieving and middle-achieving students are pointed out, as are the features common to all subjects. On the basis of the findings, interpretations are proposed regarding the probable underlying operations of metacognitive regulation. Although each transformation dimension reflects the interplay among the three operations of regulation (anticipation, monitoring, adjustment), our interpretations focus on the operation(s) that can be most directly inferred from the available data.

Conventional vs. optional transformations

An analysis of the relative proportions of conventional vs. optional transformations helps us to understand the way a subject construes his role as author of a text. Does he interpret his role narrowly, as do many beginning writers, who aim at producing a correctly written text that is essentially a carefully executed transcription of passages copied from reference books? Or, does he interpret his role in a larger perspective, which includes concerns of conventional correction, but emphasizes the author's licence to organize and compose his text as he thinks best? The subject's representation of what writing is, of what an author is supposed

to do, provides a general orientation for the metacognitive operation of *anticipation* guiding his composing activity.

Our data show that all four subjects share a common representation of the global requirements of the writing task. Each student produced a sizable number of transformations (43 to 61), and among these a substantial percentage of optional transformations (at least 42%), thereby demonstrating her comprehension that an author's role entails the selection and organization of information, and not simply the production of correct sentences.

There is, however, a significant difference between high-achieving and middle-achieving subjects with respect to the relative frequencies of conventional vs. optional transformations. As shown in Table 1, the high-achievers carry out considerably more optional transformations (81.7%), than do the middle-achievers (54.7%). Moreover, the conventional transformations carried out by the high-achievers are rarely incorrect (3.7%), compared to those carried out by middle-achievers (17.9%).

Insert Table 1 about here

At least two interpretations of these findings are tenable, and potentially complementary. The first is linked to the problem of cognitive "load" during on-line processing. It is likely that high-achieving students are able to correct errors fairly automatically, while composing their text, and therefore devote greater attention and regulating capacity to the formulation and execution of optional transformations. A second explanation would be that the high-achieving students have more cognitive "resources" for the task at hand, i.e., a more detailed and differentiated representation of how informative texts can be structured, which allows them to plan overall organisational changes, rather than simply proceed on a sentence-by-sentence basis.

Level of language affected by the transformation

Analysis of the level of language (word, group, sentence, text) affected by the transformations sheds light on the units involved in the writer's *monitoring* activity. If transformations affected a single level, such as words, it would be

plausible to infer that the writer is checking correction of spelling and/or lexical adequacy, without active monitoring of overall text structure. Conversely, if nearly all transformations were at the level of the text (as defined by intersentence relationships), this would suggest that the writer is monitoring text structure (punctuation, connectors, anaphoric referencing, etc.), while paying little active attention to word choice and spelling. Transformations at all four levels would tend to imply some form of multi-level parallel monitoring.

In our data, the high-achieving students carry out somewhat more transformations at the text level, and the middle-achieving students slightly more transformations at the word level, but the differences linked to achievement status are not significant ($p < .1032$). Although the individual distributions show some degree of heterogeneity, all four levels of language are substantially affected by the transformations carried out by each subject (i.e., any given level is involved in at least 10% of her transformations). This finding suggests that the monitoring operation deployed by the four students involves *simultaneous* processing at *multiple* language levels. More specifically, monitoring appears to entail the activation of several parallel "filters" allowing the writer to control simultaneously both local (words, groups of words) and more global (sentence, text) aspects of language. This interpretation is also supported by the fact that, each subject's sequence of transformation units varies continuously with respect to language level (for example, in Figure 1, the sequence is T, G, S, G, S, T, T, S, G...).

Object of transformation, as related to language level

The object of transformation provides an indication of the focus of the students's interest and attention while composing her text. In this respect, it gives an idea of the aims and preoccupations that guide the writer's regulation activity, and in particular her *anticipation* and *monitoring* of the on-line drafting process. To what extent is she concerned with improving or changing the informational content of the text, as compared to that of her notes? Is she searching for ways of organizing her text that differ from the existing organization of her notes? Is she attentive to correct spelling when drafting her text? Although the transformation data do not provide detailed answers to these questions, they do suggestion some interesting and plausible interpretations.

Insert table 2 about here

When the object of transformation is crossed with student achievement status, the chi^2 test indicates a significant difference between high and middle-achieving students. However, the examination of individual student profiles shows a more complex picture. In Figure 2, the transformations carried out by each subject are classified with respect to two crossed dimensions: object of transformation and level of language affected by the transformation. For each subject, two dominant categories, and several secondary categories can be identified.

Insert Figure 2 about here

The two high-achieving students have one dominant category in common, i.e., transformations affecting organisation at the level of the text, whereas their second major category differs: for Eva, it is organisation at the sentence level, but for Fanny it is the spelling of words. A similar pattern is found for the middle-achieving students. They both have one dominant concern (the spelling of words), but each has a second focal point: for Maude, information at the sentence level, and for Sonia, organisation of the sentence.

In summary, high and middle-achieving students are differentiated primarily by the fact that the former share a common concern for text organisation, while the latter have a common preoccupation with spelling. Globally, this finding is coherent with the earlier analysis of conventional vs. optional transformations.

It should be stressed, however, that achievement level is not linked to systematic, generalized differences. The transformation patterns in Figure 2 show marked individual differences, reflecting the specific aims of each child, her representation of what is important in the writing task, the way in which she anticipates and monitors her drafting activity.

Type of transformation

Type of transformation concerns the means used to carry out the transformation: addition, deletion, replacement, or transfer of location. Analysis of

this dimension allows us to specify the *adjustments* that result from the anticipation and monitoring operations of the regulation process. How broad or narrow is the repertoire of transformation tools used by sixth-graders? With what degree of flexibility are the tools used?

In Table 3 the data for type of transformation are grouped into two categories: simple transformations (by addition or deletion of an element) and more complex transformations (by replacement of one element by another, or by transfer of an element from one location to another). These categories differ significantly according to student achievement status ($p < .0157$). For high-achieving students, complex transformations are as frequent as simple ones, whereas for middle-achieving students, two-thirds of their transformations are simple and only one-third complex. The individual data for the two types of transformations within each category show that additions are more frequent than deletions (except for Maude, for whom their frequency is equal), and that replacements are much more frequent than transfers of location.

Insert Table 3 about here

In summary, our data show that all subjects make minimal use all four types of transformations. However, despite this common repertoire of tools for making adjustments in their drafts, the high-achieving students show greater mobility in their deployment of these tools. This finding, combined with the results for optional vs. conventional transformations, suggests the following profiles of student functioning: high-achieving pupils vary type of transformation so as to attain a wide range of optional transformations, whereas middle-achieving students carry out a relatively more conventional transformations using predominantly simple means. The more expert functioning of the high-achieving students might be explained by several factors: greater automatization of the simpler tools could allow for increased use of the complex ones; greater ease in the cognitive "management" of the multiple task requirements would also favor flexible use of varied tools.

Conclusion

Our analysis of text transformations shows important similarities among the four students: all carry out a majority of optional (rather than conventional)

transformations, their transformations affect all four levels of language (word, group, sentence, text), and all four means of transformation (addition, deletion, replacement, transfer of location) are used. Nevertheless, the high-achieving students can be distinguished from the middle-achieving students in three ways:

1. they carry out a relatively larger number of *optional transformations* ;
2. they show greater concern for *text organization*;
3. they make relatively greater use of *complex means of carrying out transformations* (replacement, transfer of location), as compared to simple means (addition, deletion).

Interpretations of these findings are proposed in terms of the flexibility of metacognitive regulation, resulting from the automatization of sub-processes, and from improved management of cognitive resources.

At a methodological level, this paper has shown how the analysis of text transformations can be used to make inferences about underlying operations of metacognitive regulation involved in writing. The method of analysis was illustrated for transformations between the notes students had taken and their drafts of informative texts. With small adjustments in the coding system, the method could be easily applied to other types of texts (narrative, argumentative, etc.) and to other transitions in a multi-phase writing activity (e.g., transformations between outline and initial draft, or between any given draft and a subsequent version).

Notes

[1]This study was carried out under the direction of the author of this paper by a research team composed of Marie-Gabrielle Dupertuis, Yviane Michel and Madelon Saada-Robert. We thank the three teachers - Olivier Coste, Jean-Marc Hohl, Marina Pot - who participated in the reference group for the study.

[2]The limited findings for the dimension "formatting" are mentioned in the discussion of the results for "object of transformation".

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Figure 1 : Illustration of the coding system applied to an excerpt

Subject: Eva

Transformation (Unit of analysis)	Level	Form.	Type	Obj.	Conv.
1. /deletion of dashes in P1/	T	F	D	O	Op
2. /underline title/	G	F	R	O	Op
3. les-->Les	S	P	R	O	C+
4. (les enfants) africains	G		A	I	Op
5. (...tôt), (pour...)	S	P	A	O	Op
6. /transfer 14th pt. P1 to 2nd sentence P2/	T		T	O	Op
7. /deletion of alignment to margin/	T	F	D	O	Op
8. Chaque matin	S		D	I	Op
9. le petit africain (conduit) --> certains (conduisent)	G		R	O	Op

etc.

Table 1. *Conventional vs. Optional Transformations, by Student Achievement Status*

Achievement Status	Conventional Incorrect	Conventional Correct	Optional	Total[a]
High-achieving	3.7	14.7	81.7	100.0 (109)
Middle-achieving	17.9	27.4	54.7	100.0 (95)
Total	10.3	20.6	69.1	100.0 (204)

[a]Percentages are calculated by line on the number of transformations given between parentheses

$p < .0001$

Table 2. *Object of Transformation, by Student Achievement Status*

Achievement Status	Object of transformation				Total[a]
	Minor aspect	Spelling	Infor-mation	Organ-isation	
High-achieving	10.1	11.9	19.3	58.7	100.0 (109)
Middle-achieving	5.3	29.5	28.4	36.8	100.0 (95)
Total	7.8	20.1	28.4	48.5	100.0 (204)

[a]Percentages are calculated by line on the number of transformations given between parentheses
$p < .0011$

Figure 2: Object of transformation, crossed with level of language
Individual profiles

= at least 20% of the subject's transformations

= at least 10-19% of the subject's transformations

Objects: Minor aspect of text
Spelling
Informational content
Organization

Levels: Word
Group of words
Sentence
Text

Subject : Fanny
(high-achieving)

Object of transformation

Level of language	Minor	Spell	Info	Organ.
Word		▨		▨
Group				▨
Sent.				▨
Text				▨

Subject : Eva
(high-achieving)

Object of transformation

Level of language	Minor	Spell	Info	Organ.
Word				
Group			▨	▨
Sent.			▨	▨
Text				▨

Subject : Sonia
(middle-achieving)

Object of transformation

Level of language	Minor	Spell	Info	Organ.
Word		▨		
Group				▨
Sent.				▨
Text				▨

Subject : Maude
(middle-achieving)

Object of transformation

Level of language	Minor	Spell	Info	Organ.
Word		▨		
Group			▨	
Sent.			▨	▨
Text				▨

Table 3. *Type of Transformation, by Student Achievement Status*

Achievement Status	Type of transformation[a]		Total[b]
	Simple	Complex	
High-achieving	49.5	50.5	100.0 (109)
Middle-achieving	66.3	33.7	100.0 (95)
Total	57.4	42.6	100.0 (204)

[a] Simple transformations = addition, deletion; complex transformations = replacement, transfer of location

[b]Percentages are calculated by line on the number of transformations given between parentheses

$p < .0157$

Appendix 1

PROCÉDURE DE DÉPOUILLEMENT DES TRANSFORMATIONS

A) TRANSCRIPTION DES TRANSFORMATIONS:

1) Procédé:

- On procède au dépouillement à partir du **texte d'arrivée**, on repère chronologiquement le passage transformé (B) sur ce texte, en le comparant au texte initial (A).
  La transformation est inscrite sur la feuille de codage selon les conventions suivantes:
  a) passage A --> passage B
  ex: mère --> maman
  b) (passage non modifié) passage modifié
  ex: (les enfants) africains = africains est ajouté, ou supprimé
  c) /description de transformation/
  ex: /déplacement à la L14/

- On tient compte des corrections "lisibles" effectuées sur le texte A.
  Ex: flèche rajoutée pour déplacer un paragraphe, mot biffé... on abstiendra pas contre de relever l'adjonction douteuse d'un "s".

2) Unités de transformation:

- Une transformation complexe est décomposée si elle donne lieu à des codages différents. Ex: Habits --> habits ;
  Si deux transformations sont reliées de manière causale directe et ont le même code, on note une seule transformation. Ex: l'enfant marche - ils marchent; ce sont des habits - ils portent des habits.

- Si on a une adjonction et une suppression dans une même unité de transformation, , on note remplacement (A+S=R).
  Ex: vêrte - vertes.

- Lors de transformations concernant plusieurs phrases ayant le même codage, on prend comme unité de transformation chaque unité d'information délimitée par la mise en page, par le thème, par la continuité de l'information dans les sources, et/ou par des indices d'observations récoltés par ailleurs (entretiens et observation).

B) CODAGE

1) Niveau de la transformation:

M (mot)
G (groupe)
P (phrase)
T (texte)

- Il s'agit de déterminer le niveau du langage affecté par le **résultat de la transformation:** quand on change une lettre, c'est le mot qui est transformé, quand on change un mot, c'est le groupe qui est transformé, etc.

- Toutefois, il peut y avoir des variantes selon le type de transformation effectuée: quand une unité est ajoutée ou supprimée, la transformation porte sur le niveau supérieur (ajouter une phrase transforme le texte = T); quand elle est remplacée, la transformation porte sur la même unité (le crayon -> les crayons , ou le grand crayon -->le petit crayon = G).

- Si la transformation concerne le plan sémantique, on code la plus petite unité concernée bien que la portée du changement puisse éventuellement affecter tout le sens du texte.

- Lorsqu'il y a ajout ou suppression d'une phrase entière (on note une seule transformation, niveau T)

Cas particulier: titres et sous-titres: s'ils sont présents dans le texte A, le niveau de la transformation est M ou G. S'ils sont ajoutés ou supprimés, le niveau est T.

Le **groupe** est considéré comme une unité définie par une fonction (le plus souvent plusieurs mots, mais parfois un seul: "aujourd'hui").
- Si un changement de groupe entraîne un changement automatique d'un autre groupe, on code une seule fois G. Ex. l'enfant marche - ils marchent
  mais: l'enfant marche - il saute, est codé P.

La **phrase** est déterminée par la ponctuation minimale produite par l'enfant et par le sens implicite.
- Lorsqu'une phrase du texte de départ contient déjà une ponctuation de fin de phrase (PFF) et qu'il y a rajout de la majuscule, ou vice versa, on code P.

Le **texte** est défini par la relation interphrase y compris les renvois entre phrases (pronominalisations, anaphores, etc)
- Lorsqu' il y a ajout de PFF + majuscule, ou ajout de PFF ou de majuscule (en tant qu'unique marque de P), la transformation est de niveau T.

2. Ponctuation/Mise en page:

Ponctuation: on note **P** les transformations portant sur la ponctuation ainsi que celles portant sur les modifications **minuscules - majuscules** (dans les deux sens) lorsqu'elles sont signes de ponctuation.

Mise en page: on note **m** les transformations portant sur:
- les soulignés
- les graphismes particuliers (majuscules, caractères, etc)
- les lignes sautées entre deux paragraphes
- les déplacements, adjonctions, suppressions des titres, sous-titres, points de repères, etc...

3. Type de transformations:

A (adjonction)
S (suppression)
R (remplacement simple ou composé S+A, R+A, ou R+S)
D (déplacement)

Il définit **en quoi** consiste la transformation, comment elle s'effectue

4. Convention:

- Lorsque la transformation est opérée en conformité aux **conventions normées de la langue écrite**, lorsque ces conventions linguistique **l'exigent**, on code +.
- Lorsque l'effet de la transformation est **non conforme aux exigences des conventions** de la langue écrite, on code -.
- On code **op (optionnel)**, lorsque la transformation n'est pas exigée par les conventions de la langue écrite.

5. Objet de la transformation:

On notera **sur quoi** porte la transformation:

C (contenu sémantique en relation avec le référé, changements lexicaux impliquant une transformation d'information).
O (organisation, enchaînement du discours, articulateurs, pronominalisation, mise en page ponctuation (y.c. majuscules début phrases), éléments de syntaxe, variations lexicale pour supressions des répétitions, expressions organisatrices des discours).
F (forme orthographique d'usage et grammaticale, chiffres écrits en lettres.)
A (autres, ajustements mineurs, synonymes forts: ex. mère - maman)

- Lorsque C a pour conséquence directe un changement de l'organisation O, on note C, en priorité.

- Lorsqu'il y a ajout ou suppression d'une phrase entière, Cprime sur O si l'information est nouvelle ou bien différenciée du reste du texte; sinon, l'objet est O.

6. Effet de la transformation:

Il s'agit de noter si les transformations améliorent ou affaiblissent le texte, soit du point de vue des conventions linguistiques de mise en texte, soit du point de vue des spécificités du type de texte (informatif, argumentatif, narratif)

Ex: Effets améliorants: +
Effets affaiblissants: -
Effets nuls: 0 (ajout / suppression d'info plausible mais non contrôlable....)

7. Remarques:

Explications interprétatives, remarque sur approche générale.

Ex: suppression d'une répétition
cohérence (cf. transfo X)
information restructurée sur plusieurs phrases

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