A SLIP OF THE PEN, THE EYE OR THE MIND? ACCIDENTAL SCRIBAL MISTAKES IN GREEK DOCUMENTARY PAPYRI[1]

Joanne Vera Stolk *Leiden University*

Abstract. — Both corrected and uncorrected accidental scribal mistakes in Greek documentary papyri are collected and analyzed in this article in order to observe and to examine the cognitive processes during their production, such as perseveration, anticipation and reversal. A categorization is proposed that also allows one to analyze performance errors in documents that have not been copied visually. Based on close observation of both scribal and editorial practices involved in the correction of accidental mistakes, some general principles are formulated with regard to the editorial notation of these mistakes.

Keywords: mistakes, errors, corrections, writing practices, Greek documentary papyri

Introduction

Scribal mistakes in postclassical Greek have mainly received attention in the realm of textual criticism to literary texts, where they are generally regarded as a failure to produce an accurate copy of the exemplar or "unintentional errors committed by well-meaning but sometimes stupid or sleepy scribes."[2] Similar types of accidental slips during copying can be identified in duplicate papyrus documents.[3] Just like philologists, linguists have been

[1] This paper was presented at the 30th International Congress of Papyrology, Paris, 25–30 July 2022. I would like to thank the participants of this congress, especially James Cowey, as well as three anonymous reviewers for their useful comments and suggestions.

[2] Quoted from B.M. Metzger and B.D. Ehrman, *The Text of the New Testament. It's Transmission, Corruption and Restoration.* Fourth edition (Oxford 2005) 258; see also L.D. Reynolds and N.G. Wilson, *Scribes and Scholars.* Third edition (Oxford 1991) 222.

[3] R. Yuen-Collingridge and M. Choat, "The Copyist at Work: Scribal Practice in Duplicate Documents," in P. Schubert (ed.), *PapCongr. XXVI* (Geneva 2012) 827–834; J. Cromwell, "Coptic Documents in Two Copies: A Study of Corrections and Amendments," in T. Derda, A. Łajtar, and J. Urbanik (eds.), *PapCongr. XXVII* (Warsaw 2016) 1055–1073; M. Vierros, "Copying Practices in Ptolemaic Egypt. A Discussion based on Greek Agoranomic Contracts from Pathyris," *Tyche* 33 (2018) 207–230. Copy mistakes

Bulletin of the American Society of Papyrologists 61 (2024) 241–265.
 doi: 10.2143/BASP.61.0.3293799

keen to distinguish significant variation, in this case the spelling variants reflecting the history of the (spoken) language, from the "Verschreibungen," "sheer mistakes and slips of the pen" or "garbage errors" with which the Greek papyri abound.[4] Attempts have also been made in printed and digital papyrus editions to differentiate between the editorial correction of an scribal mistake and the editorial regularization of linguistic variation, although this division has been difficult to apply in practice.[5] With the help of Trismegistos Text Irregularities, a collection of all editorial regularizations in online editions of documentary papyri (see section 4), this paper seeks to address the following questions: How can we identify accidental mistakes? What are the cognitive mechanisms involved in the production of such mistakes? And how can we deal with them in papyrus editions?

What is a mistake?

Errors have been analysed since the end of the nineteenth century by (psycho)linguists in order to examine the cognitive mechanisms involved in the production of language.[6] Speech errors are also thought to be relevant for understanding the process of language learning and (second) language acquisition. Errors can be divided into performance or mechanical errors and errors of knowledge or competence. This distinction lies behind the conscious use of the two terms "mistake" (i.e. performance error) and "error" (i.e. knowledge error). In written language production, errors of performance can be defined as "unintentional slips of the pen which the writer recognizes, either immediately or subsequently, to be erroneous deviations from the intended product," while errors of knowledge "arise

can also be found in inscriptions, cf. R. Wachter, "Der Informationsgehalt von Schreibfehlern in griechischen und lateinischen Inschriften," *WürzJbb* 18 (1992) 21–22.

[4] Quotes taken from, respectively, S.G. Kapsomenakis, *Voruntersuchungen zu einer Grammatik der Papyri der nachchristlichen Zeit* (München 1938) 4; F.T. Gignac, *Gram.* 1.59; R. Lass, *Historical Linguistics and Language Change* (Cambridge 1997) 62.

[5] J.V. Stolk, "Encoding Linguistic Variation in Greek Documentary Papyri. The Past, Present and Future of Editorial Regularization," in N. Reggiani (ed.), *Digital Papyrology II: Case Studies on the Digital Edition of Ancient Greek Papyri* (Berlin/Boston 2018) 119–137.

[6] Cf., e.g., the collected historical papers in V.A. Fromkin (ed.), *Speech Errors as Linguistic Evidence* (The Hague 1973), and the useful application of this system to a historical corpus of Messapic inscriptions by S. Marchesini, "'Excursus' metodologico sugli errori di scrittura. Analisi di un 'corpus' epigrafico dell' Italia antica," *Studi Classici e Orientali* 50 (2004) 197–199. More examples in inscriptions can be found in A. Sartori and F. Gallo (eds.), *L'errore in epigrafia* (Milano 2019).

when a person misspells a word through total or partial ignorance of the word's correct, standard spelling."[7] The majority of the spelling variations that receive editorial regularization in documentary papyri thus fall into the second category according to this definition and they have received most attention in linguistic studies. It is likely, however, that the first type of errors, i.e. the slips, mistakes or performance errors, can be found in papyri as well. Performance errors usually follow the rules of normal language production, despite of being unconsciously produced during writing.[8] These performance errors are thus unintentional and may elicit self-correction, while knowledge errors are mainly correctable by others.[9] The principle of self-correctability may be difficult to apply in practice, especially in historical sources, as someone may only notice the mistake when attention is drawn to it and we usually do not know whether the scribe has put any effort into spotting or correcting mistakes after writing.[10] Self-corrections are found in documentary papyri, but it is impossible for us to ask the writer about possible intentions for the presence or absence of corrections.

So how can we distinguish between performance and knowledge errors in Greek papyri? In order to identify performance errors, the principle of systematicity, or, in other words, the frequency and regularity of occurrence of a form in the language of the writer and his/her contemporary peers, provides an important additional indication of whether a given form is likely to have been intended or not. Gignac uses these principles of frequency and regularity in order to decide whether a variation in spelling is "phonologically significant," i.e. the written form is reflecting a (change in) pronunciation in the spoken language.[11] Interchanges reflecting phonological changes tend to be frequently and regularly attested in the language of the papyri, even if the resulting form of a word may not be regularly attested on its own, like στ[ρ]ᾰττεός for στρατηγός identified as an "outright scribal error" in the Leiden+ Documentation guidelines.[12] The full form στραττεός is indeed rare, but it combines multiple interchanges

[7] A.W. Ellis, "Slips of the pen," *Visible Language* 13.3 (1979) 266.

[8] B.J. Baars, *Experimental Slips and Human Error: Exploring the Architecture of Volition* (New York 1992) 9–13.

[9] H.D. Brown, *Principles of Language Learning and Teaching* (New York 2000) 217–218.

[10] C. James, *Errors in Language Learning and Use. Exploring Error Analysis* (New York 1998) 76–86.

[11] Gignac, *Gram.* 1.57–60.

[12] Leiden+ Documentation guidelines at https://papyri.info/docs/leiden_plus#orthographic-regularization [accessed March 2023]; Stolk (n. 5) 129.

that are attested more often: the gemination of ττ, the interchange of ε for η and the omission of γ (resp. attested 57, 825 and 199 times in TmI).[13] It is, therefore, probably not an accidental mistake or performance error, but should be analysed as an error of knowledge, just like any other (combination of) phonologically motivated spelling variations. Furthermore, when a specific variant spelling of the word is frequently attested in documentary papyri, one has to be careful identifying this spelling as erroneous at all. In contrast to modern languages with fully codified standard orthographies, spelling in Postclassical Greek is highly conventional, but not yet completely codified and with potential for variation in orthographic norms.[14] Spatial and chronological changes in orthographic norms can indeed be observed in Greek documentary papyri.[15] When orthographic norms have changed, even if just locally or temporarily, these variant forms should not be considered knowledge errors, because in these cases the spelling is likely to be considered conventional not only by the writers themselves, but also by their contemporary peers.

The cause and source of a mistake

It may seem difficult to retrieve the source of an accidental mistake that was made two thousand years ago, but one should not confuse source with cause. While the real cause for a performance error is likely to lie (at least partially) outside of the written document itself, the source or inspiration for the resulting mistake may, among others, be found in the direct linguistic context. The relation between the source (inspiration for the error) and target (resulting performance error) will lie at the basis of the categorization into the three basic cognitive mechanisms discussed in this article (see below).

[13] Trismegistos Text Irregularities at www.trismegistos.org/textirregularities [accessed March 2023]; see also M. Depauw and J.V. Stolk, "Linguistic Variation in Greek Papyri. Towards a New Tool for Quantitative Study," *GRBS* 55 (2015) 196–220.

[14] J. Clackson, "Latinitas, Ἑλληνισμός and Standard Languages," *Studi e Saggi Linguistici* 53.2 (2015) 309–330.

[15] For example, the spelling τρεισκαιδέκατος "thirteenth" is used during the Ptolemaic period, while τρισκαιδέκατος is conventionally found during the first three centuries of Roman rule in Egypt; see J.V. Stolk, "Post-Classical Greek from a Scribal Perspective: Variation and Change in Contemporary Orthographic Norms in Documentary Papyri," *Mnemosyne* 73 (2020) 754–758.

The cause of performance errors

The cause for the lapse is often impossible to retrieve, but that does not keep scholars from speculating about it. Sleepiness is a popular one, as Quintilian already stated in the *Institutio Oratoria* (10.3.27) that "fatigue will make us careless in writing." The "copyists more asleep than awake" mentioned by Jerome in his Preface to the Gospels (383 CE) feature also in more recent analyses of the phenomenon, such as "It is certainly no secret that a scribe engaged in copying a manuscript is susceptible to fatigue, especially when copying continuous script."[16] In psychological research, these "lapses of attention" have been studied in more controlled environments, leading to the following observations:

> … these slips occur under relatively uniform conditions: during the execution of some automatized task in a familiar setting in which attention has been claimed by some internal preoccupation or by some external distraction. Errors seem to happen either because attention was not switched back to the task in hand at a critical decision point, thus allowing the control of action to be snatched by some strong motor program normally associated with that juncture, or because attention is directed to the ongoing routine activity at a time when it would have been better to leave the guidance of action to the "automatic pilot." In the former case, the errors take the form of strong-habit intrusions or exclusions; and in the latter, omissions and repetitions.[17]

Errors thus occur due to some kind of distraction taking the focus away from the activity leading to routine production, such as replacing a rare form by a more common form, or, the other way around, because extra attention is (re)directed to a routine activity which could lead, for example, to repetition. Both of these types of lapses can be observed in the examples from the papyri cited below. While any kind of behavioural or contextual factors, such as "internal preoccupations" or "external distractions" to the scribe at the time of writing, remain difficult to point out based on written sources only, certain types of distractions could occasionally be observed in the written product itself. For example, the need to re-ink the pen was a regular distraction for scribes: it introduced a pause, movement of the

[16] Quoted from K. Aland and B. Aland, *The Text of the New Testament: An Introduction to the Critical Editions and to the Theory and Practice of Modern Textual Criticism* (Grand Rapids, MI 1987) 285; see for further observations on this topic in earlier literature P.M. Head and M. Warren, "Re-inking the Pen: Evidence from P.Oxy. 657 (P^{13}) concerning Unintentional Scribal Errors," *New Testament Studies* 43 (1997) 466–473.

[17] J.T. Reason, "Lapses of Attention in Everyday Life," in R. Parasuraman and D.R. Davies (eds.), *Varieties of Attention* (Orlando 1984) 547.

eye and hand, and potential for a mistaken re-start.[18] In the work of skilled scribes, re-inking is usually not visible, but also other changes in the way of writing before and after the mistake may suggest a pause of some sort. The same may apply to line breaks in the written text (or in the exemplar in case of copying), which cause the hand to change position, give the mind a break and new start in language production and let the eyes wander to other places in the text or the exemplar.[19]

The source of performance errors

While it may often be impossible to give the cause for the "incalculable blunders of a wandering eye," the linguistic output or "blunders" themselves are not totally "incalculable."[20] The possible source for the newly introduced feature may be identified in the direct context. The source of accidental errors in language production can be defined as an "element elsewhere in the linguistic context or non-linguistic environment that interferes with the target element and in some way modifies what is produced."[21] Potential sources in the environment (or mind) of the writer, such as the language that the speaker is hearing or seeing written or other distractions the writer is exposed to at the time of writing, are not always known to us, but the immediate linguistic context of the error is more likely to be preserved. In those cases, the direction of the relationship between the source (the letter that interfered with the letter produced by accident) and the target (the intended letter) can be determined:

1. Perseveration: the source is preceding the target,
2. Anticipation: the source is following the target,
3. Reversal: the source and target are interchanged (also called metathesis or transposition).

[18] Head and Warren (n. 16). The same re-inking intervals in literary and documentary papyri often seem to overlap with natural linguistic units; see R. Yuen-Collingridge, "Between Autograph and Copy. Writing as Thinking on Papyrus," *Book History* 21 (2018) 1–28, and G. Schwender, "Scribal Process and Cognitive Philology in Didymus the Blind's Lectures on Psalms (Tura Codex V)," in R. Ast, M. Choat, J. Cromwell, J. Lougovaya, and R. Yuen-Collingridge (eds.), *Observing the Scribe at Work* (Leuven 2021) 325–346.

[19] Cf. J. Thaisen, "Initial Position in the Middle English Verse Line," *English Studies* 95 (2014) 500–513; M. Depauw, "Word-Split Frequency in Greek Documentary Papyri (with an Appendix on Syllabification)," in K. Bentein and Y. Amory (eds.), *Novel Perspectives on Communication Practices in Antiquity* (Leiden 2023), 184–190.

[20] Quoted from F.G. Kenyon, *Books and Readers in Ancient Greece and Rome* (Oxford 1932) 70.

[21] Quoted from J.P. Stemberger, "Spontaneous and Evoked Slips of the Tongue," in G. Blanken *et al*., *Linguistic Disorders and Pathologies. An International Handbook* (Berlin/Boston 1993) 55.

This basic typology was originally defined for speech errors ("slips of the tongue"), but can also be applied to written errors ("slips of the pen").[22] This approach has the advantage that it is meant to classify errors in language production more generally and not only those made while visually copying from an exemplar, although it does allow us to accommodate more typical copy mistakes as well. For example, the copyist of a duplicate document wrote φάφους instead of τάφους and corrected his mistake by inserting the letters τα above φα.[23] The accidental production of φ instead of the τ (= target) at the beginning of the word could have been influenced by the φ appearing at the beginning of the next syllable (= source). Since the source is following the target, this accidental mistake seems to be produced by anticipation. More examples of these types of accidental mistakes with a source in the direct context can be found in documentary papyri.

Collecting accidental mistakes in documentary papyri

Non-standard spellings are usually noticed by the editors of documentary papyri and marked in some way, both in printed and digital editions. More than 150,000 of these editorial linguistic comments have been collected from more than 50,000 texts in Trismegistos Text Irregularities.[24] The most common way to mark a variant spelling is by means of a comment (*l.* for *lege* "read") in the apparatus (92%), but also angular brackets < > for omissions and braces { } for erroneous additions are in regular use.[25] Although there are different ways to encode spelling variants, these methods have not been used with any consistency to mark the differences between phonological variation and accidental mistakes.[26] In order to find accidental mistakes among this multitude of (mostly phonologically motivated) variants, we thus need to use a different approach. If frequency and regularity are the key to distinguish potential cases of phonological variation from accidental performance errors (see the section on 'what is a mistake?'

[22] Stemberger (n. 21) 56. In the application of this typology to Messapic inscriptions, Marchesini (n. 6) distinguishes the terms "posticipazione" and "anticipazione," both with and without a "stimulus" (= source), and "errori di scambio" of non-adjacent and adjacent letters, besides other categories that do not involve a source in the direct linguistic context.

[23] According to Vierros (n. 3) 224.

[24] See www.trismegistos.org/textirregularities and Depauw and Stolk (n. 13).

[25] Cf. Stolk (n. 5) 124–125.

[26] For the brief use of the "corr" tag to mark "outright scribal errors" in digital editions see Stolk (n. 5) 123–124.

above), vice versa, infrequent and irregular interchanges are likely to reveal potential cases of non-phonologically motivated variation.

In order to test this hypothesis, I have collected a dedicated corpus consisting of the types of editorial regularizations that occur only once in Trismegistos Text Irregularities.[27] The single occurrence of these error types is likely to be due to chance in many instances, but this at least ensures the relative rarity of the types of changes. Out of the 1956 types occurring once, only 438 affect letter(s) within a word. Of course, the omission or addition of a specific whole word or phrase is likely to be unique, but these instances are usually not caused by performance errors only. Changes to full words and phrases (N=1518) are thus left out. Similarly, changes of one morpheme or lexeme (including numbers and symbols) into another one are left out (N=216), since they may involve morphological or semantic confusions rather than performance errors. Finally, there are a couple of instances for which the interchange, albeit of a rare type, seems (mainly) phonologically motivated (N=20), such as ἀφτῶν instead of αὐτῶν (*P.Amst*. 1.48.15). In some cases, the writer seems to have been hesitating between several phonologically plausible options resulting in a combination of potential graphemes, such as in the spelling υημων instead of ὑμῶν (*P.Oxy*. 16.1831.3). Those are left out as well.

For comparison, I also collected similar features that have been corrected by the ancient scribes themselves.[28] Out of all scribal corrections collected in Trismegistos for which the linguistic level has been annotated (N=20826), I selected the changes at the level of one letter, defined as one grapheme or phoneme (N=3905), leaving out all instances that could possibly be phonologically motivated (N=1497). In order to reduce the number even further, I left out omissions (N=1162), for which a possible source is often more difficult to identify, at this stage.

[27] For Trismegistos Text Irregularities, see n. 24. The corpus used here was based on the (offline) updated version of the database (state April 2022), containing editorial regularizations from all published papyri in the Papyrological Navigator (state 2016).

[28] More examples of scribal corrections of spelling, grammar and stylistics could be found, respectively, in J.V. Stolk, "Itacism from Zenon to Dioscorus: Scribal Corrections of <ι> and <ει> in Greek papyri," in A. Nodar and S. Torallas Tovar (eds.), *PapCongr. XXVIII* (Barcelona 2019) 690–697; A. Papathomas, "Das Ringen um korrekte Sprache, guten Stil und rechten Sinn. Grammatische und stilistische Verbesserungen auf spätantiken griechischen Papyrusbriefen (5.-8. Jh. n. Chr.)," in P. Swiggers (ed.), *Language, Grammar, and Erudition* (Leuven 2018) 145–166; R. Luiselli, "Authorial Revision of Linguistic Style in Greek Papyrus Letters and Petitions (AD i-iv)," in T.V. Evans and D.D. Obbink (eds.), *The Language of the Papyri* (Oxford 2010) 71–96.

Analysis of the mistakes

The remaining 202 unique types of word-internal regularizations and 1246 scribal corrections of non-phonological changes to one letter were analysed in order to identify the source. For a large number of them, a possible source could be found in the immediate linguistic context (within the word itself or the word preceding or following). These types can be categorized as perseveration (preceding source), anticipation (following source) and reversal (metathesis).

Direction	Unique regularizations (uncorrected by scribe)	Corrections by scribes
Perseveration	27 (22%)	226 (33%)
Anticipation	46 (37%)	440 (64%)
Reversal	52 (41%)	18 (3%)
Subtotal	125 (100%)	684 (100%)
Uncertain	77	562
Total	202	1246

Table 1: The relation between source and target among regularizations and corrections

Each of the three types of relationships between target and source occurs among both the editorial regularizations (uncorrected by scribes) and the scribal corrections. Reversal is well represented among the uncorrected unique types of regularizations and anticipation is very common among the corrections, although the different nature of the two subcorpora does not allow for detailed comparison of the types of mistakes. Below, I will examine examples of these three categories: perseveration, anticipation and reversal, including and comparing both corrected and uncorrected cases.

Perseveration

Perseveration, i.e. the source precedes the resulting error, usually shows in the form of repetition of one or more preceding letters. Cases in which an adjacent consonant is repeated immediately afterwards can be difficult to distinguish from the numerous instances of phonologically motivated dittography related to the loss of quantitative distinction in

Greek.[29] When the repeated grapheme is non-adjacent or when it is not just added but replacing another grapheme, the repetition is more likely to be the result of a performance error. For example in Figure 1, ξ is produced instead of λ, probably the result of repetition of the ξ in the preceding syllable.

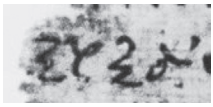

Fig. 1: *P.Sijp.* 56.15 (TM 110221) ξυξα instead of ξύλα

The most common type of perseveration in the corpus of unique types of irregularities is the repetition and addition of a short string without omitting or replacing anything else, as the examples of repetitions in Figure 2 and 3.

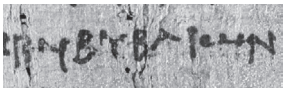

Fig. 2: *P.Lond.* 7.2065.3 (TM 1626) βυ{βυ}βλίων

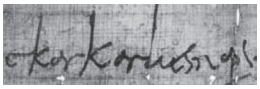

Fig. 3: *P.Kramer* 13.1 (TM 35513) καγ{καγ}κελλάρ(ιος)

It seems that at least some of these repetitions of sequences are due to a short pause, e.g. lifting or re-inking the pen. The first of the repeated segments in Figure 2 and 3, βυ and καγ respectively, seem to have been written continuously after the preceding letters, while the repetition may have been the result of starting the word from the beginning after a short pause. The repeated strings βυ and καγ are also followed by the same letters, *beta* and *kappa* respectively, which may have added to the confusion between the segments.

[29] See Gignac, *Gram.* 1.154–165.

In the case of a simple addition, as in Figures 2 and 3, the repeated segment can be marked with brackets { } in the transcription or the regular spelling could be given in the apparatus. Both options are used by editors. The brackets in the transcription have the advantage that the irregular spelling is immediately signalled and solved for the reader. The addition of one set of brackets does not hamper the reading more than leaving a non-existing Greek word in the transcription in most of these cases. For replacements, as in Figure 1, it is often better to opt for a regularization of the full form in the apparatus. This avoids the use of multiple types of brackets in word, e.g. ξύ{ξ}<λ>α, making the form more difficult to process for the reader of the edition.

Anticipation

Anticipation, or a cognitive or visual jump forward, is a common type of performance error inspired by a following source. Anticipation of a following letter (= source) could result in addition (i.e. repetition) of the same source letter, replacement of the target letter by the following source letter or omission of the target letter and/or any intervening letters. In case of the addition of the same adjacent letter, i.e. dittography, the result of anticipation of a following letter, e.g. ε{τ}τέρῳ, would be identical to perseveration of the preceding letter, e.g. ετ{τ}έρῳ, or phonologically motivated dittography of the consonant -ττ-.[30] When resulting in replacement or involving non-adjacent source and target letters, anticipation could be more easily be recognized.

In the following subsections, I will compare examples of anticipation with replacement to anticipation with omission. I will look into more detail at one particular type of anticipation with omission, which seems to be very common in Greek papyri, but is not generally recognized in the cognitive typologies, namely the omission of not only the target letter but also the intervening letters between target and source.[31]

[30] Cf. Figure 19 below. In order not to be forced to make a choice between either of these three options as an editor, it would be best to regularize the spelling of such cases of dittography (or haplography) in the apparatus without putting brackets in one position or the other.

[31] The classification of writing errors by Ellis (n. 7) 268 distinguishes between anticipation and perseveration with addition (resp. a{d}bcde or abcd{b}e) and with replacement (e.g. a{d}<b>cde or abc{b}<d>e). Omission errors (e.g. a<b>cde or abc<d>e) are taken as a separate category not involving anticipation (p. 272). Similarly, the application to Messapic inscriptions by Marchesini (n. 6) includes anticipation and perseveration with

Anticipation with replacement and omission

When the target letter is replaced by another letter which can also be found in following linguistic context (= source), the replacement may be due to anticipation of that following letter. Compare, for example, αθοητητος written instead of ἀβοήθητος in Figure 4. Here the β has been replaced by a θ, which may have been inspired by the following θ later on in the word. Thus the replacement of β by θ could be regarded as an example of anticipation with a following non-adjacent source.

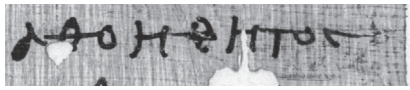

Fig. 4: *BGU* 2.522.7 (TM 28173) αθοηθητος instead of ἀβοήθητος
© Ägyptisches Museum und Papyrussammlung, Staatliche Museen zu Berlin, Scan: Berliner Papyrusdatenbank, inv. 8343

One could even speculate about a second instance of anticipation with replacement in this word: there may have been a hesitation about the second θ or even correction of the second θ from (the start of) a τ. This could be in anticipation of the third consonant τ. In that case, the second replacement seems to have been corrected (immediately), while the first one is not.

Anticipation of a following letter (= source) could not only result in omitting the target letter and replacing it with the (then repeated) source letter, but it could also result in omitting the target letter without replacement. In that case, the omitted target letter(s) should have something in common with the following source letters in order to identify this omission as anticipation. Many omissions, however, do show such a contextual source in the form of a letter that the omitted element and the following direct context have in common. For example in Figure 5, the omitted element <βδ> is also found further on in the word Ἀ<βδ>αοβδα, which could make this a case of anticipation resulting in the omission of the first occurrence of the repeated sequence.[32]

replacement and addition, but keeps omissions (of one or multiple letters) as separate categories. Unfortunately, the corpus of Messapic inscriptions used for this study contained very small numbers of errors and almost no examples of (non-adjacent) anticipation and perseveration (see Marchesini [n. 6] 207–208).

[32] Ellis (n. 7) 272 call this "letter masking" in correspondence with the similar phenomenon of "phoneme masking" defined for speech errors; see D.G. MacKay, "Forward and Backward Masking in Motor Systems," *Kybernetic* 6 (1969) 57–61. In letter masking

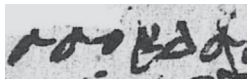

Fig. 5: *P.Yadin* 1.15.35 (TM 23494) Ἀ<βδ>αοββδα

These types of anticipation with replacement and omission cited so far are relatively rare in the corpus of documentary papyri. Most common is anticipation of a following source with omission of a repeated sequence as well as any intervening letters. This particular type of anticipation will therefore be discussed in more detail in the following subsections.

Uncorrected anticipation with omission of intervening letter(s)

As I have shown in the previous section, the omitted letter(s) have to be repeated in the following linguistic context in order to identify an omission as due to anticipation. The influence of the following source letters could not only result in omission of the target letter(s), but also of any intervening letter(s). For example, in *depence* instead of *dependence*, both the recurring sequence *en* as well as the intervening letter *d* are omitted.[33] The same phenomenon is often noticed in literary manuscripts, where the omission of the repeated and intervening letter(s) may apply to multiple syllables, full words or even full line(s) of text. It is generally thought to be the result of a "wandering of the eye" and called *parablepsis* ("looking aside"), "eyeskip," "Augensprung" or "saut du même au même." The terms *homoioarcton* viz. *homoioteleuton* are used when the repeated sequence concerns, respectively, the similar beginning or ending of two words or lines.[34] Reynolds and Wilson describe the process as follows:

> Here the scribe, finding the same word twice within a short space, copies the text as far as its first occurrence; then looking back at the exemplar to see what he must copy next he inadvertently fixes his eye on the second occurrence of the word and proceeds from that point. As a result the intervening words are omitted from his copy.[35]

one or perhaps two letters are omitted due to their occurrence in the direct linguistic context, but the intervening letters are produced as normal, for example *than wen* instead *than when* (example from Ellis, n. 7, 272, example 13). This process could go forwards (see English example before) as well as backwards (see example in Figure 6 above).

[33] Example from Ellis (n. 7) 273, example 17. Ellis calls this phenomenon "haplology" in correspondence with the phonological process of elision of one of two similar sounding syllables (p. 272).

[34] See Metzger and Ehrman (n. 2) 253; Aland and Aland (n. 16) 285; Kenyon (n. 20) 71.

[35] Reynolds and Wilson (n. 2) 226.

This visual jump forward is here explicitly understood to start after the production of the first of the two identical strings of letters and end with the omission of the second repeated string and any intervening letters(s). Since it also occurs in written corpora that have not been produced by visual copying from an exemplar (as the one used by Ellis, n. 7), this type of omission may not only result from a visual jump, but also from a cognitive jump forward during writing. This type of omission by jumping forward could, therefore, also be understood in terms of cognitive anticipation of a following source, as the cognitive process of language production is always a bit ahead of the motor process of writing the letters. Cognitive anticipation would then typically result in anticipation of a few letters or (short) words rather than complete lines of text as in the case of visual anticipation. Anticipation is triggered when target and source show similarities, such as the *sigma* in ἑνός and νομίσματος in Figure 6.

Fig. 6: *BGU* 12.2183.4 (TM 34857) ενοσματος instead of ἑνὸς νομίσματος
© Ägyptisches Museum und Papyrussammlung, Staatliche Museen zu Berlin, Scan: Berliner Papyrusdatenbank, inv. 21776

The jump from the final *sigma* of ἑνός to the *sigma* in νομίσματος resulted in the omission of one of the two *sigma*s as well as the intervening letters νομι. Since only one of the two *sigma*s is missing, one could ask whether indeed the second occurrence was omitted, as in the interpretation of visual copying cited above, or rather the first one, as in the example of anticipation with omission in Figure 5 above. As the outcome of the two processes would be identical, how do we know whether a given scribe omitted the first occurrence of the repeated letter or the second one?

The question may seem irrelevant when confronted with the end result, but in fact the issue frequently surfaces in editorial decisions. Like the additions due to perseveration (see above), anticipations with omission are usually indicated by the editor by means of brackets in the transcription. The placement of brackets requires a decision by the editor which of the two identical (strings of) letters should be marked as omitted together with the intervening letter(s). Consider the following two options for brackets for the example in Fig. 6 above: ἑνὸς <νομίσ>ματος or ἑνὸ<ς νομί>σματος. If these are considered copy mistakes following the process sketched by Reynolds and Wilson quoted above, one would expect the first occurrence

of the repeated letter to be written out and the second occurrence to be omitted before continuing to write afterwards: ἑνὸς <νομίσ>ματος. Cognitively, however, they may be other ways in which this jump forward from *sigma* to *sigma* may have been processed by the writer. In the cases cited in Figure 4 and 5 above, it is understood that the first (= target) letter is omitted and not the later occurrence of the same letter (= source of anticipation). So the jump towards the second identical letter could perhaps have happened with the first letter cognitively processed but not actually written yet, and thus omitting the first letter and intervening string in order to continue writing from the second occurrence, as in the example cited in Figure 7, printed as ὁ <μεμισθω>μένος in the *editio princeps*.

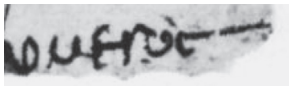

Fig. 7: *SB* 20.14983.16 (TM 23840) ομενος instead of ὁ μεμισθωμένος
© Heidelberger Papyrussammlung

The editor of this papyrus, James Cowey, reads the word as it is on the papyrus in the transcription and adds the brackets ὁ <μεμισθω>μένος in the apparatus with the following commentary note: "How exactly the scribe came to leave out the three first syllables of μεμισθωμένος is difficult to say, other than that he has started the word after ὁ with the wrong μ of three, each of which begins a new syllable." In this case, the target letter (the first μ) is thus perceived as omitted and put inside the brackets, while the anticipated source is understood as the first letter that is written out.

Based on these examples, one could wonder whether the placement of the editorial brackets does not rather depend on syllable and word boundaries. Placing brackets at syllable or word boundaries may often be easier for the reader, but it is not a consistently used editorial practice either. This can be observed in Figure 8, for which K<ερκ>ευσῖριν is printed in the *editio princeps*, while <Κερ>κευσῖριν would perhaps have been expected based on syllable boundaries.

Fig. 8: *P.Tebt.* 1.110.7 (TM 3746) κευσιριν instead of Κερκευσῖριν
© Courtesy of the Center for the Tebtunis Papyri, University of California, Berkeley

Closely observing the ink, however, I wonder whether the slightly faded letters κε and the darker υ would not suggest a (re-inking) pause in between. This could be reflected by reading Κε<ρκε>υσῖριν instead, but observing the process of production is not always possible and rarely certain.

Corrected anticipation with omission of intervening letter(s)

Rather than studying the practices of editors, one could also have a look at the practices of the ancient writers of the papyri themselves and the way in which they would correct similar performance errors. From the scribal corrections the following pattern emerges.[36] All of the word-internal insertions have been placed starting from above the first written identical letter, in between the identical and following letter or even directly above the following letter(s). This placement of the omitted string after the first occurrence of identical letters suggests that the insertion was, at least during correction, perceived as the second occurrence of the two identical letters. This results mostly in insertions of a syllable consisting of a consonant followed by a vowel, which also complies with the general rules for word splits at line breaks.[37] For example in προ\νο/ητής in Figure 9, following a small space after προ- the writer anticipated the η, later adding the omitted νο above the η. This seems to have been done after re-inking and perhaps it was even corrected immediately, before finishing the end of the word in -της.

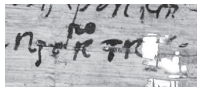

Fig. 9: *PSI* 13.1338.23 (TM 17254) προ\νο/ητής
© Istituto Papirologico "G. Vitelli" (University of Florence)

[36] The selection of scribal corrections annotated for this study only concerns corrections of one phoneme or grapheme (see table 1 above). The full corpus of omissions of various lengths contains more than 8000 instances and would be too large to study in any detail, let alone check the readings of each instance in the printed edition and on an image of the papyrus. It was possible, however, for me to isolate a selection of interesting examples by focussing on word-internal insertions of more than one letter. Out of these 198 cases, 35 correct an omission including repeated letter(s) similar to the examples described above. The way in which the correction is printed in the edition (and sometimes differently in the digital edition) does not always tell exactly in what position the correction was made. Leaving out all uncertain readings (6×) and papyri for which no image is available (11×), ultimately the placement of the remaining 18 insertions was examined on the image.

[37] See calculations in Depauw (n. 19) 189–190.

For the example in Figure 9, and many other examples, this division makes sense phonologically and morphologically. The same practice of adding the intervening letters together with the second occurrence of the identical letter above or slightly after the first occurrence of the identical letter is also found in cases where other options may seem to have been available with respect to the phonological or morphological unity of the inserted string, as in ὁμολο\γο/ῦντι in Figure 10.

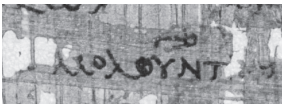

Fig. 10: *CPR* 1.28.10 (TM 9858) ὁμολο\γο/ῦντι
© Österreichische Nationalbibliothek, Papyrussammlung P.Vindob. G 12247

The inserted γο above the υν would point towards the interpretation ὁμολο\γο/ῦντι. Here one would perhaps rather have expected ὁμολ\ογ/οῦντι to complete the lexeme ὁμολογ- and keep the already written ending -ουντι with the phoneme ου intact. Apparently, the syllabic practice to write first the intervening letter and then the second identical letter may have been stronger than the notion of the phonological or morphological boundaries of the word in question and may perhaps also have superseded the visual or cognitive process responsible for the production of the performance error in the first place. Only occasionally, slightly different syllable structures are found in this small corpus of word-internal corrections, such as combinations of three or more letters. Still, also in these longer strings, such as στρατι\ωτι/κῆς in Figure 11, the same order is found of adding the intervening letters <ωτ> above after the first identical letter ι, only then followed by the second identical letter <ι>.

Fig. 11: *BGU* 3.1011.2.4 (TM 44037) στρατι\ωτι/κῆς
© Ägyptisches Museum und Papyrussammlung, Staatliche Museen zu Berlin, Scan: Berliner Papyrusdatenbank, inv. 9796

Word-initial insertions seem to have been treated differently from the word-internal ones above. In word-initial position, insertions are often made before the identical letter, as in \με/μετρήμεθα in Figure 12, suggesting that it was the first occurrence that was omitted and added later.

Fig. 12: *P.Prag.* 1.56.8 (TM 12776) \με/μετρήμεθα
© National Library of the Czech Republic Gr. I 76

This may again be related to the syllable structure or morphological units starting at the beginning of the word, but it may also just have been the result of the available space. Spacing between words is not standard practice in documentary papyri, but it is regularly found, as in Figure 12, where the <μ> was inserted in the space before and the <ε> written through the first μ of μετρημεθα.

The decision on how to correct a certain mistake may thus depend on multiple factors, such the syllable structure or how much space there is to make a correction, and may not reflect the process by which the mistake was produced. Therefore, the above examination of the scribal corrections probably does not give an accurate representation of the cognitive process of production of these mistakes either, but – in absence of a better analysis – modern editors could perhaps still follow the example given by the scribes and add omissions of repeated sequences word-internally after their first occurrence and word-initially before them. This often results in simple and phonologically and morphologically sound syllables that can be easily processed by the reader. This may also have been a good motivation of the scribes themselves for the placement of the correction precisely in that position.

Reversal

The reversal of letters, also called metathesis or transposition, is a relatively common interchange and most instances concern the reversal of two adjacent letters. While the reversal of a vowel and a liquid (ρ, λ) is attested more frequently and may have been related to pronunciation,[38] the unique reversals in the corpus collected here involve letters that are phonologically dissimilar, such as ε and τ in ουτερανος for οὐετρανός in Figure 13.

Fig. 13: *P.Vet.Aelii* 2.4 (TM 17471) ουτερανος instead of οὐετρανός
© P.Vet. Aelii, Plate I

[38] See examples in Gignac, *Gram.* 1.314–315.

The frequent occurrence of certain letter sequences, like ουτε-, may have contributed to accidental reversals of less frequent sequences, such as ουετ-. The more common patterns are cognitively more straightforward to produce for the scribe than the intended ones and, therefore, easily produced by accident. Next to the presence of frequent letter combinations in the mental lexicon of the scribe, the presence of letter(s) in the direct context of writing may also have influenced the production of reversals, such as τκ for κτ in Figure 14.

Fig. 14: *P.Lond.* 3.1225.9 (TM 22847) αποτατκου instead of ἀποτάκτου

The start of τκ may have been influenced by the τ (= source) earlier on in the same word, just like the examples of perseveration cited above. Only in this case, the perseveration led to a full reversal of τκ instead of κτ. While full reversals are not uncommon in the corpus, very few complete reversals seem to have been corrected by scribes themselves (see table 1 above). An exception may be found in Figure 15, where Ταουητος was corrected to Ταηουτος by the writer.[39] The apparent reversal Ταουητος was corrected by crossing out the η and inserting it again above the line before ου.

Fig. 15: *P.Oxy.* 41.2967.3 (TM 16531) Τα\η/ου⟦η⟧τος

Comparatively, corrections of anticipation are very common in the corpus of scribal corrections (see table 1 above). Among the examples of corrected anticipations, one can find many instances that are very similar to cases of reversal, such as επιδηδες corrected to ἐπίτηδες in Figure 16 by adding the τ above the first δ.

[39] The Greek spellings Θαυης, Ταυης, Ταουης or Θαουης of the Egyptian name Taues are all more common than Ταηους (see TM Nam 1215), so the correction may not have been necessary.

Fig. 16: *P.Giss.Apoll.* 9.7 (TM 19429) ἐπ[ί]τηδες corr. from επιδηδες: τ above δ

Anticipation with replacement, such as writing δ instead of τ in Figure 16, could be understood as a case of incomplete reversal or transposition:

> Because pen slips can be detected very rapidly relative to writing speed, writers can stop after detecting the first letter of transpositions, leaving on paper something indistinguishable from an anticipatory error.[40]

It seems that in the many cases of anticipation that could possibly result in reversal, the mistake is noticed before the second letter is produced and only the first letter needs to be corrected. Therefore, corrections of both letters after the production of a complete reversal are relatively rare. Perhaps in those cases it is more likely that the reversal went unnoticed and was not corrected by the scribe at all.

Editorial practice

Among the rare types of regularizations there are not only accidental mistakes by the scribes, but also some mistakes by the editors. For example in Figure 17, the spelling τιμωιτάτωι was regularized to τιμιωτάτωι in the apparatus of *P.Brem.* 20, while in fact the papyrus clearly reads τιμιωιτάτωι (*l.* τιμιωτάτωι).

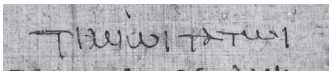

Fig. 17: *P.Brem.* 20.2 (TM 19605) τιμωιτάτωι l. τιμιωτάτωι, but read: τιμιωιτάτωι

Not just the reading itself, but also the placement of brackets can lead to editorial confusion. The transcription of Figure 18 in the *editio princeps* reads φ(αω)φι, which was entered in the *DDbDP* as Φφι, l. Φ<αῶ>φι.

[40] Quoted from D.G. MacKay, "Slips of the Pen, Tongue, and Typewriter: A Contrastive Analysis," in G. Blanken *et al.*, *Linguistic Disorders and Pathologies: An International Handbook* (Berlin/Boston 1993) 66–72.

Both types of brackets are unnecessary, however, as there seems to be enough space and even some remains of the supposedly missing letters, which can be read as Φαῷφι based on the image.

Fig 18: *P.Flor*. 2.243.16 (TM 11124) φ(αω)φι, but read: Φαῷφι
© Florence, The Biblioteca Medicea Laurenziana

There are more cases of mistaken or forgotten brackets in the digital editions in the *DDbDP*.[41] Particularly challenging is the notation of scribal corrections in digital editions, since there are only limited options in Leiden+ to reflect the exact appearance and process behind a correction with the scribal correction tag. Because this tag "is used for entire words and not for the corrected characters alone," corrections are often mispresented in the online edition.[42] For example, the correction ἐτέρῳ in Figure 19 is marked with the apparatus entry "corr. from ττερῳ", although it is more likely that the first letter τ was written accidentally and immediately corrected to ε, before the second τ was actually produced. This would be described more accurately as "ἐτέρῳ: first ε corrected from τ".

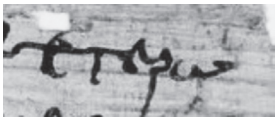

Fig. 19: *P.Oxy*. 67.4597.4 (TM 78639) ἐτέρῳ: first ε corrected from τ
© Courtesy of The Egypt Exploration Society and the Faculty of Classics, University of Oxford

Complex scribal corrections are even more difficult to reflect in a comprehensible way. The edition of Figure 20 below reads ἀπ' αὐτῶν in the transcription of the *editio princeps* with the correction from αὐτῶν in the apparatus presented with παυ printed above it, which is an transparent

[41] Rather than spelling them out here I have corrected the more straightforward ones directly through the Papyrological Editor.

[42] Quoted from the guidelines in the Leiden+ Documentation see https://papyri.info/docs/leiden_plus#scribal-correction [accessed March 2023].

description of the situation (in the reprint in *SB* 8.9689 the correction is not mentioned at all).

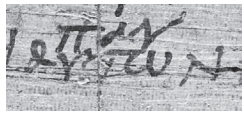

Fig. 20: *P.Abinn.* 46.4 (TM 10036) ἀπ᾽ αὐτῶν corr. from αὐτῶν: παυ above υτω

Of course, printing above letters is not possible at the moment in the Papyrological Navigator (and also not always in printed editions). In the digital edition, this correction is indicated with brackets as ἀπ᾽ \παυ/αυτῶν in the transcription and l. αὐτῶν in the apparatus, but this gives the wrong impression: the π now seems to be written twice, while it is only written above the line. The insertion of the π directly above the υ could perhaps better be understood here as a replacement rather than a simple addition: ἀ⟦υ⟧\π᾽ αὐ/τῶν. For more complex replacements, like this one, it may be more convenient for the reader if the corrected reading is printed in the transcription (ἀπ᾽ αὐτῶν) and the correction only given in the apparatus (ἀπ᾽ αὐτῶν corr. from αὐτῶν: παυ above υτω).

Together with Jean-Luc Fournet, I have developed and described a more consistent and comprehensive system for the notation of various types of scribal corrections in the new Guidelines for Editing Papyri.[43] This system also relies on the use of brackets in the transcription for deletions and insertions, while we advise to defer the more complex corrections involving substitution to the apparatus with the corrected form in the transcription.

Conclusions

Generally speaking, accidental scribes mistakes – or performance errors – can be distinguished from phonologically motivated variation – or knowledge errors – by the principle of systematicity. Performance errors are understood to be unsystematic, unintentional and unconsciously produced and are more likely to result in self-correction than knowledge errors.

[43] https://aip.ulb.be//PDF/Guidelines_for_editing_papyri.pdf [accessed March 2024] 17–24; also published in *Cd'É* 97 (2022) 323–329.

It is therefore expected that there are many more performance errors to be found corrected by scribes in documentary papyri, while most of the knowledge errors, such as non-standard spellings due to phonological variation, remain uncorrected. Both corrected and uncorrected mistakes have been collected and compared in this paper in order to analyze the cognitive processes during their production. While it may seem impossible to reconstruct the production of each error of performance with accuracy in hindsight, it turned out that for a large number of them a possible source can be found in the direct linguistic context. The source (the letter(s) that inspired the performance error) could precede the target (the intended letter), which is called perseveration, the source could follow the target (anticipation) or source and target could be interchanged (reversal). Cases of perseveration, anticipation and reversal can be identified among both the uncorrected and corrected mistakes in Greek documentary papyri.

Perseveration often results in repetition of preceding letter(s), although the addition or omission of adjacent letters can be difficult to distinguish from phonologically motivated dittography or haplography. Even for simple omissions of letter(s) there often seems to be a possible source of anticipation in the direct linguistic context. I have argued that the phenomenon called *saut du même au même* (e.g. based on *homoioteleuton* or *homoioarcton*) can also be understood as a type of anticipation with omission of the repeated and intervening letters. This process is often interpreted as a visual jump of the eye, whereby the copyist after having written the first occurrence jumps straight to the second occurrence on the exemplar and continues writing from there. A similar phenomenon, however, could also occur in written documents that have not been copied visually, as a result of a cognitive jump. While anticipation is very common among the corrected mistakes, the reversal of letters often seems to have been uncorrected. It may be that as soon as an anticipation mistake was noticed by the scribe, the first letter would have been corrected and, therefore, it would not result in a full reversal of both letters. In the cases where it did, it seems less likely that the mistake would have been noticed at all.

How does one represent these performance errors in the transcription of the text? In the case of simple additions or omissions, the accidentally added or omitted letter or segment can be marked with brackets in the transcription. A visual or cognitive jump in anticipation of a second identical sequence could have happened before or after the first occurrence was written. Sometimes it may be possible determine based on the ink or spacing whether the first or the second occurrence was omitted and this can be visualized by the position of the brackets in the transcription. In

most cases, however, the placement of the brackets in editorial regularizations as well as the chosen method of scribal correction may not accurately reflect the cognitive process leading to the production of the slip in the first place. Rather, omissions of repeated sequences are typically inserted by the writer after their first occurrence word-internally or including the first occurrence word-initially when there is enough space. The same practice could be followed in editorial regularizations. In those cases where it is difficult to determine where the bracket should go or those instances that are difficult to distinguish from phonologically motivated variation, like haplography or dittography, regularization in the apparatus seems a good alternative. For complex replacements, it will often be easier for the reader to process a regularization in the apparatus than a combination of brackets in the transcription.

The cause of an accidental scribal mistake is usually impossible to determine, as we do not know what the scribe was doing, thinking or looking at during writing. Following the observations from psychological experiments, cited in the section "The cause and source of a mistake," performance errors may, for example, be the result of a distraction leading to inattentive routine production or perhaps redirected extra attention resulting in repetition. Both processes may be observed among the scribal mistakes in documentary papyri. Routine production may have resulted in the writing a more frequently occurring letter sequence instead of an infrequent one, as in Figure 13, while several examples may be due to redirected attention after a short pause, such as a line break or re-inking the pen, resulting in repetition of a sequence (cf. Fig. 2 and 3). Close observation of the material features may thus help us to reconstruct the production process in more detail.

Although it has been possible to distinguish performance errors from phonologically motivated knowledge errors in this paper by a strict selection process, this would not be possible in every instance. Accidental mistakes still follow normal processes of language production. The routine production of frequently occurring sequences is very similar to the cognitive process involved in the conversion of phonemes to graphemes when spelling consciously, especially in cases where the standard spelling is not known to the writer.[44] Knowledge errors could be influenced by the direct linguistic context (e.g. priming), while performance errors could

[44] For more on the different cognitive methods to produce spelling in Greek papyri see J.V. Stolk, "A Cognitive Approach to Spelling Production in Historical Sources: Explaining the Variation between <e, ai> and <o, ō> in Greek Documentary papyri," *Transactions of the Philological Society* 119.3 (2021) 289–314.

also be influenced by the sound of the letter. The cognitive processes involved in the production of accidental and conscious spellings thus overlap and information about scribal intentions or awareness of mistakes is not always available in historical documents. Complete separation of the two types of mistakes may thus be impossible, as they are both the product of the same mind of the scribe.