

Jan Kochanowski University Press

This is a contribution from *Token: A Journal of English Linguistics*
Volume 14/2022.

Edited by John G. Newman and Marina Dossena.

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Similarity measurements in tracing textual affinities: A study of Psalm 129 in 16th-century devotional manuals*

Magdalena Charzyńska-Wójcik

Nanovic Institute for European Studies at the University of Notre Dame and John Paul II Catholic University of Lublin

Jerzy Wójcik

John Paul II Catholic University of Lublin

ABSTRACT

The paper examines 30 instances of Psalm 129 in 16th-century English devotional manuals printed during the reign of the first three Tudor monarchs. The objective of the study is to detect relationships between the analysed texts and compare them to available Psalter translations to determine textual affinities. This is achieved by applying similarity measurements which can capture intertextual relations in mathematical terms. The obtained results are subsequently verified against the available textual and philological knowledge, which corroborates the similarity scores of individual texts. In the single instance where similarity scores seem to be defied by the information provided in the literature on the topic, textual analysis proves the applied method right. The examination presented in the paper shows that English devotional practices in the turbulent period when they were emerging were much more complex than the purely denominational differences between Catholics and Reformers (often misconceived from the present-day perspective) might suggest.

Keywords: psalm translations, primers, *Book of Common Prayer*, text similarity measurement.

* The authors would like to thank Dr Kinga Lis for perspicacious comments on the first draft of this paper and anonymous reviewers for valuable observations.

1. Introduction

Ever since its emergence the Psalter has been a central text in the devotional life and spirituality of those acquainted with it. Its importance in Judaism outlived the emergence of Christianity to the effect that the Psalter has occupied a special place in both religions. The Psalter has remained one of the few devotional continuities to survive schisms and denominational divides, no matter how cataclysmal. Or perhaps it would be more correct to say *the psalms* instead of *the Psalter*, as not all of the 150 psalms have enjoyed the same popularity. While the religious not only sang the whole Psalter but also learnt it by heart, devotional materials designed for the lay contained only a selection of psalms (cf. Duffy 2006: 157; Morey 2000: 182-186). These religious manuals started to emerge in the mid-13th c. (Duffy 2011; Erler 1999 [2008]; Kennedy 2014) and were intended to guide the laity (de Hamel 1998) in their daily devotions and help them to participate in the services of the Church. Needless to say, these manuals were originally in Latin but in time they started to show vernacular elements (especially prayers and forms of confession; Reese Jones – Riddy 2005: 219) to the effect that in the second half of the 14th c. there emerged exclusively English manuals, i.e. also the scriptural material was offered there in translation (Butterworth 1953; Hargreaves 1956; Kennedy 2014, and Charzyńska-Wójcik - Wójcik in prep.).¹ Psalms were at the heart of these (non-standardised) anthologies for the laity (Duffy 2006: 156) called *Books of Hours* or *Primers*, which are widely regarded the most popular book of the Middle Ages (de Hamel 1998; Erler 1999 [2008]; Duffy 2006; Kennedy 2014).

With the advent of print, this popularity took on an even greater impetus. The boost given to English Biblical translations by the activity of William Tyndale² quickly resulted in the emergence of not one but more versions of the Psalter in English. In a similar manner, printed primers, which had been exclusively in Latin up to 1523 (Butterworth 1953: 5), started to show first non-scriptural vernacular material, and as of 1529 also the psalms in English. The growing multitude of printed vernacular manuals

¹ The limitations of space preclude even a broad overview of the history of psalm translations in the manuscript period, though – through Wycliffe's involvement in two of them (as part of two complete Bibles) – they had an impact on the comparatively late outset of the translational activity in England.

² This is not to deny the impact of the wider European context of Humanism and Reformation, which produced manifold new translations (cf. for example François 2018 and Charzyńska-Wójcik – Charzyński 2014 for an overview).

for prayers and of the emerging English versions of the Psalter poses the question which psalm versions were selected for which manuals.

It is the purpose of this contribution to examine several early manuals of devotion printed between 1530 and 1557 from the perspective of the psalm version printed in them in order to trace the source of these translations (Section 2). The novelty of this contribution will consist not so much in answering the posed question – though this will also be the case – as in offering a methodology for comparative evaluation of coexisting translations in objective mathematical terms (Section 3). The methodology is grounded in digital humanities and will be used to detect relationships between texts and shown to work in unison with philological examinations (Section 4). In effect, while the applied methodology independently produces results which are in concord with philological knowledge, it will be shown to be a reliable starting point in future examinations where philological textual knowledge is either lacking or inconclusive (Section 5).

2. The texts

We set out to examine the English translation of Psalm 129³ as it appears in 14 devotional manuals printed under the three successive Tudor monarchs: Henry VIII, Edward VI and Mary I. The selection of Psalm 129 is motivated by two factors: not only is it one of the Seven Penitential Psalms, which were a stable component of all primers, but it also appears in some manuals more than once (in various types of devotions). In view of the fact that the contents of primers were originally not standardised, the first factor ensures that the psalm to be examined will actually be found in all analysed manuals. The second factor, i.e. the repeated occurrence within one publication will help us in interpreting the achieved similarity scores. In particular, it is important to see if and how two or more occurrences of Psalm 129 differ from each other if they appear in the same publication, before setting out to interpret numerically expressed differences between psalms appearing in different books and representing reworkings, revisions or new translations.

The primers and manuals selected for examination are the following. For Henry VIII's rule (1509-1547) we selected the first extant primers and

³ Throughout the paper we rely on the Vulgate numbering, which derives from the Septuagint tradition. It differs from the Hebrew numbering in most psalms. In effect, what we refer to as Psalm 129 corresponds to Psalm 130 according to the Hebrew numbering.

Henry VIII's authorised Primer, listed as 01, 04-05, 07-09, and 14 below. The obvious choice for Edward VI's rule (1547-1553) are the first and second version of the *Book of Common Prayer* (cf. 16 and 18 respectively), which represented the milestone of the early Anglican Church, and the primers printed in the same years as the *Book of Common Prayer* (cf. 15 and 17 below).⁴ As for manuals of devotion printed in Mary's reign (1553-1558), we selected three: two printed in the same year, i.e. 1555 (cf. 19 and 20) and one printed late in her reign, i.e. in 1557 (cf. 21).⁵

To determine the sources of the versions of Psalm 129 contained in the examined manuals, the text of this psalm was compared to those contained in seven available prose translations of the Psalter.⁶ These Psalters are listed below in chronological order under 02-03, 06, 10-13.

List of texts⁷

- 01 *Ortulus anime* from 1530 (STC 13828.4)
- 02 George Joye's English Psalter translated from the Latin text of Martin Bucer; first published in 1530 (STC 2370)
- 03 George Joye's English Psalter translated from the Latin text of Huldrych Zwingli; first published in 1534 (STC 2372)
- 04 Marshall's primer from 1534 (STC 15986)
- 05 Godfray's primer from 1535 (STC 15988a)
- 06 Psalms from Coverdale's first complete Bible issued in 1535 (STC 2063)
- 07 Rouen primer from 1536 (STC 15993) (3 occurrences of Psalm 129)
- 08 Redman's primer from 1537 (STC 15997)⁸ (4 occurrences of Psalm 129)
- 09 *Manual of prayers* from 1539 (STC 16009) (3 occurrences of Psalm 129)
- 10 Psalms from Coverdale's second complete Bible, known as the Great Bible; first issued in 1539 (STC 2068)
- 11 Psalms from Richard Taverner's Bible issued in 1539 (STC 2067)

⁴ Cf. MacCulloch (1999 [2001]) for information on manuals of devotion under Edward VI.

⁵ Cf. Duffy (2009 [2010: 57-60]) for an overview of printing policies in Mary's reign and for information on Robert Caly and John Wayland, who printed manuals of devotion.

⁶ Although metrical Psalm translations were increasingly popular (cf. Charzyńska-Wójcik 2017), they were never printed in devotional manuals, which are restricted to prose versions.

⁷ Throughout the paper, we are going to refer to these texts using the two-digit numbering system presented here.

⁸ The original 1536 edition is in the possession of the Bibliothèque Nationale in Paris. It does not have STC and is not available through EEBO.

- 12 1539 edition of Coverdale's Psalter translated from the Latin of Johannes Campensis (first printed in 1535) (STC 2372.6)
- 13 Coverdale's Psalter translated from the Vulgate; issued in 1540 (STC 2368)
- 14 Henry VIII's primer from 1545 (STC 16034)
- 15 Primer from 1549 (STC 16052)
- 16 *Book of Common Prayer* from 1549 (STC 16270a)
- 17 Primer from 1552 (STC 16057)
- 18 *Book of Common Prayer* from 1552 (STC16288)
- 19 Caly's Primer from 1555 (STC 16062) (2 occurrences of Psalm 129)
- 20 Wayland's Primer from 1555 (STC 16063)
- 21 Wayland's Primer from 1557 (STC 16080) (2 occurrences of Psalm 129)

3. Methodology

In order to detect relationships between the versions of Psalm 129 found in the texts specified above, we are going to perform similarity measurements using the cosine distance method.⁹ Performing text similarity measurements on texts produced before the standardisation of spelling,¹⁰ required normalising the texts so that the random differences in spelling, so characteristic of English spelling before standardisation, were not treated as meaningful in the comparison. In particular, different spellings of the same word or morpheme were normalised by adopting one consistent spelling. Moreover, all punctuation was removed and all words spelled with a capital letter were turned to lower case. To ensure full consistency of the process, normalisation was performed with the use of software called VARD. VARD – from VARiant Detector is a (semi-)automatic tool (Baron – Rayson 2008, 2009) designed specially to assist research on historical data featuring spelling variation, particularly eMnE texts. The tool has so far been used as a prerequisite or

⁹ Cosine distance method for analysing historical texts has also been applied in Charzyńska-Wójcik (2021), Lis – Wójcik (in press), Wójcik (2021b), and Charzyńska-Wójcik – Wójcik (in prep.). See also Drout et al. (2011), where similarity measurements are used to detect relationships between Old English poetic texts.

¹⁰ Researchers differ with respect to the timing of the process, placing it in the mid-17th c. (Bregelman 1980), at the end of the 17th c. (Scragg 1974; Salmon 1999; Görlach 2001; Nevalainen 2012) and the 18th c. (Osselton 1963, 1984; Tiekens-Boon van Ostade 1998). Regardless of whose analysis one decides to follow, the period covered by this study predates even the beginning of spelling standardisation. For an overview of these developments see Wójcik (2021a).

pre-processor to other corpus linguistic tools such as part-of-speech tagging, semantic tagging, keyword analysis, collocations, and annotation. We apply it in the text pre-processing stage before calculating similarity scores.

Text similarity measurements are the basis of many natural language processing tasks, which play an important role in information retrieval, automatic question answering, machine translation, dialogue systems, and document matching (Wang – Dong 2020).¹¹ One of the methods of measuring text similarity is based on calculating the distance between two texts, which traditionally has been assessed by measuring length distance, using the numerical characteristics of text (number of types and tokens) to calculate the distance between texts represented as vectors (Wang – Dong 2020: 421). As observed by Welbers et al. (2017: 246), such distance measurements use bag-of-words text analysis models, meaning that only the frequencies of words per text are used and word positions are ignored. One of the most common formats for representing a text in a bag-of-words format is a document term matrix (DTM), in which rows are documents (texts), columns are terms (words), and cells indicate how often each word occurs in each text. As a result, each of the compared texts can be represented as a numerical vector whose elements correspond to the frequency of occurrence of all words in the compared texts. The advantage of this representation is that it allows the data to be analysed with vector and matrix algebra, effectively moving from text to numbers (Welbers et al. 2017: 252). Kwartler (2017: 21) notices that the bag-of-words model “treats every word [...] as a unique feature of the document. Word order and grammatical word type are not captured in a bag of words analysis”. These latter parameters, however, do not seem crucial in comparing different translations or versions of what is ultimately the same source text. So, the bag-of-words model selected for this examination focuses on analysing word selection and use and therefore promises to offer the most relevant data for the purposes of the examination pursued in this paper.

It has to be noted that there are many ways in which the distance between texts represented as vectors can be calculated. Han et al. (2012: 77) observe that vectors represented as DTM are typically very long and sparse (i.e., they have many 0 values, which correspond to words absent in one text but present in another). They further state that traditional distance measures fail for such sparse numeric data because two vectors may have many 0

¹¹ For an overview and comparison of different text similarity measurements see, for example, Goma – Fahmy (2013) or Wang – Dong (2020).

values in common, meaning that the compared texts do not share many words, but this does not make them similar. Han et al. (2012: 77-78) propose to measure similarity between sparse vectors using cosine similarity, which computes the cosine of the angle between vectors. A cosine value of 0 means that the two vectors (each representing a text) are at 90 degrees to each other and have no match (the texts are completely different, i.e. they do not share a single item). The closer the cosine value to 1, the smaller the angle and the greater the match (similarity) between vectors. The cosine similarity of 1 means that the compared texts are identical. All the calculations were performed by means of R software (R Core Team 2020), with the use of the *quantda* package (Benoit et al. 2018).

4. Results

4.1 Interpreting the scores¹²

Psalm 129 appears 30 times in the 21 publications selected for examination, 14 of which represent manuals and 7 are translations of the Psalter either as an independent enterprise or as part of the complete Bible. We compared each text with each text and as a result we received 900 scores, half of which are doubled, as the similarity between every two texts is the same, whether text A is compared to Text B or the other way around. The obtained results range between 1 and 0.597.

Let us begin with the texts which are repeated within one publication, i.e. Redman's primer (08), with four occurrences of Psalm 129, the primer from Rouen (07) and the *Manual* (09) with three occurrences of Psalm 129 in each; Caly's primer from 1555 (19) and Wayland's primer from 1557 (21), each printing this psalm twice. The first three publications exhibit similarities between the repeated texts of Psalm 129 ranging from 0.997-1.0 for Redman's primer and the primer from Rouen and 0.944-0.989 for the *Manual* from 1539. The situation changes radically when it comes to the primers from 1555 and 1557, i.e. primers printed in Mary's reign. The similarity between the two occurrences of Psalm 129 in Caly's primer is 0.757, while in the case of Wayland's primer it is 0.763. Even a cursory look at the texts of Psalm 129

¹² Although the purpose of this examination was to search for textual indebtedness of Psalm 129 as contained in devotional manuals, we also measure similarity scores between the seven complete Psalter versions and so will be commenting on these similarities as well.

contained in Marian primers shows that they offer two very distinct versions of Psalm 129 in different parts of the primer.¹³

To make this discussion less abstract, let us illustrate the scores obtained for the repeated occurrences of Psalm 129 in the 1539 *Manual* (09) with the actual text, so that we can see what it means that the similarity is assessed at 0.944, 0.948, and 0.989, as shown in Table 1 below.

Table 1. Similarity scores for the three occurrences of Psalm 129 in the *Manual* (09)

	09_1 ¹⁴ _1539 <i>Manual</i> (STC 16009)	09_2_1539 <i>Manual</i> (STC 16009)	09_3_1539 <i>Manual</i> (STC 16009)
09_1_1539 <i>Manual</i> (STC 16009)	1	0.948	0.944
09_2_1539 <i>Manual</i> (STC 16009)	0.948	1	0.989
09_3_1539 <i>Manual</i> (STC 16009)	0.944	0.989	1

As transpires from the above, out of the three occurrences of Psalm 129, the second and third are most similar (0.989); next comes the similarity between the first and second occurrence (0.948), while the first and third occurrences show most differences (0.944). Consider the texts below, where we use bold type to indicate differences between the first and third occurrences, while underlining is used to accentuate differences between the second and third occurrence.

(1)¹⁵ a. 09_1_1539 *Manual* (STC 16009)_THE VII PSALMES

FRom the depe **places** haue I called vnto the (O Lorde) Lorde heare **me**.
Let thyne eares **be intentyue to** *the* voyce of my **prayer**.

¹³ While this is intriguing in itself, we cannot take up this issue here for reasons of space.

¹⁴ Throughout the paper, the digit following text number and the underscore indicates the occurrence of the psalm in the examined text.

¹⁵ The texts quoted throughout the paper, mostly represent our own transcripts and appear in the original spelling, with abbreviations expanded (and italicised). However, as indicated in Section 3, all texts were normalised before the similarity calculations were performed.

Yf thou (Lorde) wylt **loke so straytly vpon synners** O Lorde who **shall** abyde it.

But there is mercye with the, and because of thy lawe haue I abyden the, O Lorde.

My soule hath abyden in his worde, my soule hath trusted in the Lorde.

From the mornynge watche **vnto** nyght, let Israell trust in the Lorde. For with the Lorde there is mercye, and hys redemption is plenteous. And he shall redeme Israell from all **the iniquytyes of it**.

b. 09_2_1539 Manual (STC 16009)_THE XV PSALMES

Ovt of the depe called I vnto the Lorde (O Lorde) heare my voyce. O let thyne eares consyder wel the voyce of my complaynte. Yf thou (Lorde) wylt be extreme to marke our iniquities (o Lorde) who maye abyde it?

But there is mercy with the, and because of thy lawe haue I abyden the (O Lorde).

My soule hath abyden in his worde, my soule hath trusted in the Lorde.

From the mornynge watche vntyll nyght, let Israell truste in the Lorde. For with the Lorde there is mercye and hys redempcion is plenteous. And he shall redeme Israell from all hys synnes.

c. 09_3_1539 Manual (STC 16009)_THE DIRIGE

OVte of the depe called I vnto the (O Lorde) Lorde heare **my voyce**. **O** let thyne eares **consyder well** the voyce of my **complaynte**. Yf thou (Lorde) wylt **be extreme to marke our iniquities** (O Lorde) who **maye** abyde it?

But there is mercy wyth the, and because of thy lawe haue I abyden the (O Lorde.)

My soule hath abyden in his word, my soule hath trusted in the Lorde. From the mornynge watche **vntyll** nyght, let Israell trust in the Lorde.

For which the Lorde ther is mercye, and hys redemption is plenteous. And he shall redeme Israell from al **his iniquities**.

As is clear, while the first and third occurrence (cf. 1a and 1c) represent the same text, there are also visible differences between them, reflected by the

score of 0.944. In contrast, the second and third occurrences (cf. 1b and 1c) are practically identical, with only two points of divergence: one of them intended (*sins* vs. *iniquities*) and one resulting from a printer's mistake (*with* vs. *which*), which we preserved in our attempt at not intervening in the texts beyond normalisation of variable spellings. These minute differences have scored the similarity of 0.989. It is therefore visible that scores around 0.94 and higher reflect anything between very close affinity of the compared texts and near identity.

Let us now look at the texts repeated within the same publication whose similarity scores were lowest (around 0.7), i.e. Marian primers (19 and 21). They invite comparison with the lowest values of similarity obtained in the whole data set, which turn out to be those for Psalm 129 from Coverdale's Psalter translation based on the Latin of Johannes Campensis (12), whose similarity scores range from 0.597-0.69. Once again, let us illustrate the above results by quoting the actual texts. The similarity scores between Psalm 129 in Coverdale's translation of Campensis (12) and the two versions of this psalm in Caly's primer (19) are given below.

Table 2. Similarity scores for Psalm 129 in Coverdale's Psalter (12) and Caly's primer (19)

	12_1539 edition of Coverdale's Psalter (STC 2372.6)	19_1 Caly's primer (STC 16062)	19_2 Caly's primer (STC 16062)
12_1539 edition of Coverdale's Psalter (STC 2372.6)	1	0.597	0.602
19_1 Caly's primer (STC 16062)	0.597	1	0.757
19_2 Caly's primer (STC 16062)	0.602	0.757	1

(2)¹⁶ a. 12_1539 edition of Coverdale's Psalms from the Latin of Campensis (STC 2372.6)

When I was almost suncken in the very depe waters of troubles,
I called for thy helpe o Lorde.

¹⁶ We follow the convention of marking differences between texts by bold type, but it is restricted here to (2b) and (2c). (2a) departs from (2b) and (2c) to such an extent as to render this impractical.

Lorde heare my voyce, I beseke the, let thyne eares be inclyned vnto my dolorous peticyons.

If thou wylt for euermore remembre the wyckednesses that we haue done, or laye them vp by *the* in keypyng O Lorde, who maye be able to abyde.

Therefore folow thys rather whyche is naturall for the, thou mayeste gracyeuslye forgyue oure synnes: and therowe thy goodnesse to lyfte vp them that were fallen: and so to induce them to the ryght worshyppynge of the.

I haue styll wayted for the Lorde, my soule also hath wayted for hym: And because he had promysed to stande by me, I doubted not, but that he wolde abyde by his worde.

My soule wayted more feruently for the lordes commynge, then the nyght watchers loke for the mornynge tyme: then *the* watchers (I saye) which beyng heuy for slepe, wayte for the daye tyme, that they maye take theyr rest.

Let euery man of Israel (yf he be wyse) wayte for the Lorde, for he is most mercyfull of kynde and of hys owne nature most redy to helpe. Wherefore he shall delyuer Israel from all hys iniquytes, be they neuer so many.

b. 19_1_1555 Caly's Primer (STC 16062)_SEVEN PSALMS

FRom the depthe I called on thee (O Lorde) Lorde heare my voice.

Let thyne eares **take good heede to** the voice of my **praier**.

If thou Lorde **wilt loke straitlye vpon** synnes, **O Lorde**, who shall abide it?

But **with thee is mercy, and for thy lawe I haue suffred thee, O Lorde.**

My soule hathe abyden in hys worde, my soule **hathe trusted in our Lorde.**

From the morning watch **vntil nighte**, let Israell truste **in** oure Lorde.

For with our Lord there is mercye, and **with hym is** plenteous redemption.

For he **will** redeme Israell from all his iniquities.

c. 19_2_1555 Caly's Primer (STC 16062)_THE DIRIGE

OUt of the bothomles pit of my heuy trouble I cal vnto the, o lorde, lord heare my prayer.

Let thy eares **be attent vnto** the voice of my **complaint**.

For if thou Lord, **imputest mens** sinnes **vnto them**, lord who shal / not fall?

But **thou art** mercyfull and easie to entreate: **that we might** reuerence and feare thee.

Oure Lorde is my hoope **vnto whome** my soule cleueth, and I beleue his worde.

My soule is set **vpon our Lord** from the **one** mornynge watch **vnto the other**.

Let Israel trust **vnto** our lord for with our lorde is there **both infinite** mercye *and* plentuous redemption.

For **it is** he **that** redemeth Israell from all **theyr sinnes**.

As clearly transpires from the above, we are dealing with three different texts, whose similarity scores reflect two facts: they all ultimately derive from the same Hebrew original and they are in English. We can thus conclude that similarity scores of 0.757 (between 2b and 2c) and lower (between 2a and 2b-2c) indicate no direct textual affinities and capture the fact that different texts in the same language deal with the same subject matter. In what follows we will move on to interpreting the obtained similarity scores in search of textual affinities.

George Joye's two Psalters were a popular source of Psalm 129 in the examined manuals. In particular, Joye's first Psalter (02),¹⁷ based on the Latin of Martin Bucer¹⁸ and first printed in 1530 in Antwerp was relied on in four manuals. Chronologically speaking these are: *Ortulus anime* (01), with the similarity score of 0.994 between the two texts. Next comes Marshall's primer (04) from 1534 (the first primer printed in London and perhaps the first book ever printed in England containing entire psalms in English; Butterworth 1553: 52), with the score 0.989, and Godfray's primer (05), scoring 0.99. And finally, there is the primer printed in 1549 (15), i.e. under Edward's rule, which also shows considerable similarity to Joye's 1530 rendition: 0.983. These relationships and the detailed similarity scores are shown in Table 3a and 3b respectively.

¹⁷ As a matter of fact, it is the first printed English Psalter and a fascinating topic in itself. For more on that, see Charzyńska-Wójcik (2014) and Wójcik (2019).

¹⁸ Martin Bucer prepared a new translation of the Hebrew Psalms into Latin and printed it in September 1529 under the pseudonym Aretius Felinus, hence the appellation "feline Latin", occasionally encountered in the literature (cf. Wójcik 2019).

Table 3a. Devotional manuals relying on George Joye’s 1530 translation for Psalm 129

02 George Joye’s English Psalter translated from the Latin text of Martin Bucer; first published in 1530 (STC 2370)			
↓			
01 <i>Ortulus anime</i> from 1530 (STC 13828.4)	04 Marshall’s primer from 1534 (STC 15986)	05 Godfray’s primer from 1535 (STC 15988a)	15 Primer from 1549 (STC 16052)

Table 3b. Devotional manuals relying on George Joye’s 1530 translation for Psalm 129 – similarity scores

	02	01	04	05	15
02 ¹⁹	1	0.994	0.989	0.99	0.983
01	0.994	1	0.992	0.997	0.985
04	0.989	0.992	1	0.989	0.993
05	0.99	0.997	0.989	1	0.982
15	0.983	0.985	0.993	0.982	1

Joye’s second translation of the Book of Psalms (03), this time based on a different Latin source, namely the Latin of Zwingli was first printed in August 1534. It constituted the source for the 1536 primer from Rouen (07), where this psalm appears as many as three times, and each time it is drawn from the same source, with the similarity scores ranging from 0.994 to 0.997. It is also used in a primer printed in 1555 by Caly (19), i.e. under Mary’s reign. As noted above, there are two occurrences of Psalm 129 in this primer: it appears in the Seven Psalms and in the Dirge, and it is the Dirge version that shows affinity to Joye’s 1534 Psalter, with the similarity score of 0.949. This version is also used in one of the two occurrences of Psalm 129 in the 1557 Wayland’s primer (21), also in the Dirge, where its similarity score to Joye’s 1534 translation is 0.947.

¹⁹ For the clarity of presentation, we are going to rely on text numbers in the tables with scores. Also, we use bold face to indicate the crucial scores in the tables.

Table 4a. Devotional manuals relying on George Joye's 1534 translation for Psalm 129

03	George Joye's English Psalter translated from the Latin text of Huldrych Zwingli; first published in 1534 (STC 2372)	
↓		
07 Rouen primer from 1536 (STC 15993)	19 Caly's Primer from 1555 (STC 16062) (Dirge)	21 Wayland's Primer from 1557 (STC 16080) (Dirge)

Table 4b. Devotional manuals relying on George Joye's 1534 translation for Psalm 129 – similarity scores

	03	07	19	21
03	1	0.994-0.997	0.949	0.947
07	0.994-0.997	1	0.949-0.952	0.948-0.951
19	0.949	0.949-0.952	1	0.998
21	0.947	0.948-0.951	0.998	1

Another frequent source of Psalm 129 in the analysed publications is the 1537 edition of Redman's primer (08), although it shows no textual affinity to any of the translations of the whole Psalter we are aware of. In particular, *Manual* from 1539 (09) contains three occurrences of Psalm 129. All three occurrences show greatest similarity to Redman's Primer, with the similarity scores of 0.951–0.995. Redman's text is also the source of Psalm 129 in Henry VIII's primer (14), primer from 1552 (17), and Wayland's primer from 1555 (20), with the similarity scores ranging between 0.945 and 0.965. Moreover, one of the two occurrences of Psalm 129 in Caly's 1555 primer (19) (in the section with the Seven Psalms) shows a very high degree of similarity to Henry VIII's primer (14), with the similarity score of 0.953. The same is true of Wayland's primer from 1557 (21), with the identical similarity score.

Table 5a. Devotional manuals relying on the 1537 Redman primer for Psalm 129

08 Redman's primer from 1537 (STC 15997) ²⁰ (4 occurrences of Psalm 129)			
↓			
09 <i>Manual of prayers</i> from 1539 (STC 16009)	14 Henry VIII's primer from 1545 (STC 16034) ↓	17 Primer from 1552 (STC 16057)	20 Wayland's Primer from 1555 (STC 16063)
	19 Caly's primer from 1555 (STC 16062) (Seven Psalms) 21 Wayland's primer from 1557 (STC 16080) (Seven Psalms)		

Table 5b. Devotional manuals relying on the 1537 Redman primer for Psalm 129 – similarity scores

	08	09	14	17	19	20	21
08	1	0.951-0.995	0.949-0.952	0.945-0.949	0.889-0.892	0.961-0.965	0.889-0.892
09	0.951-0.995	1	0.923-0.941	0.916-0.941	0.88-0.891	0.927-0.958	0.88-0.891
14	0.949-0.952	0.923-0.941	1	0.996	0.953	0.922	0.953
17	0.945-0.949	0.916-0.941	0.996	1	0.949	0.926	0.949
19	0.889-0.892	0.88-0.891	0.953	0.949	1	0.928	0.998
20	0.961-0.965	0.927-0.958	0.922	0.926	0.928	1	0.928
21	0.889-0.892	0.88-0.891	0.953	0.949	0.998	0.928	1

The last two manuals whose sources remain to be established are the two versions of the *Book of Common Prayer*, i.e. the first version from 1549 (16)

²⁰ Again, the original 1536 edition is in possession of the Bibliothèque Nationale in Paris; it does not have STC and is not available in EEBO.

and the second version from 1552 (18). Psalm 129 in both versions shows very high similarity scores to three other productions: Coverdale's second complete Bible translation (10), with the similarity score of 0.964, Coverdale's first complete Bible translation (06) and Taverner's Bible printed in 1539 (11), which both show the similarity of 0.947. This is in consonance with historical facts: Taverner's Bible is a slightly revised edition of Matthews Bible of 1537. Matthews Bible, prepared by John Rogers, relied on the portions of the Bible which Tyndale had managed to translate. For the parts that Tyndale had not translated, Rogers relied on Coverdale's first Bible printed in 1535 (Daniell 2003: 193). It is, therefore, only to be expected that the similarity scores for Taverner's Bible and Coverdale's 1535 Bible should be very high. As a matter of fact, the two texts of Psalm 129 in these publications are identical, which is reflected by the similarity score of 1. The similarity of Coverdale's second complete Bible to his first text (0.976) also reflects the fact that it offers a revised text of his first rendition.

Table 6a. Devotional manuals relying on Coverdale's Great Bible for Psalm 129


10 Psalms from Coverdale's second complete Bible, known as the Great Bible; first issued in 1539 (STC 2068)	
	
16 <i>Book of Common Prayer</i> from 1549 (STC 16270a)	18 <i>Book of Common Prayer</i> from 1552 (STC16288)

Table 6b. Devotional manuals relying on Coverdale's Great Bible for Psalm 129 – similarity scores

	10	16	18
10	1	0.964	0.964
16	0.964	1	1
18	0.964	1	1

Two publications remain to be discussed: the 1539 edition of Coverdale's Psalter first printed in 1535 (12) and Coverdale's Psalter translated from the Vulgate issued in 1540 (13). The former is based on the new Latin rendition of the Psalms prepared by Johannes Campensis. As has already been noted at the outset of this section, this text shows the lowest similarity scores to all the remaining texts (0.597-0.69). Ferguson (2011: 154) in discussing Coverdale's treatment of the Latin of Campensis refers to it as a paraphrase, which tallies with our results: it does not resemble any of the remaining six Psalter translations analysed here. Moreover, it does not constitute a source of any of the examined manuals. When it comes to Coverdale's Psalter translated from the Vulgate (13), its highest similarity scores are for Redman's 1537 primer (08) – 0.919 and the *Manual* from 1539 (09) – 0.91-0.916. This might reflect a common source text, i.e. the Vulgate.

4.2 Verifying the scores

Let us now see how the above results compare to the available textual and philological knowledge. For the period 1529-1545, we shall rely on Butterworth's (1953) seminal work on primers. The textual provenance of psalms contained in the two *Books of Common Prayer* is discussed in Jacobs (2013). As for the remaining texts, there is no comprehensive study covering this topic.²¹

With respect to the textual affinities expressed in Table 3a, they are all confirmed in full by Butterworth's (1953) examinations. In particular, Butterworth (1953: 39, 59 and 64, 76-77) states explicitly that the 1530 *Ortulus* (01) and Marshall's (04) and Godfray's (05) primers are based on Joye's 1530 translation (02). Butterworth does not discuss the 1549 primer (15), shown in Table 3a to also descend from Joye's 1530 rendition, since his study does not go beyond Henry VIII's 1545 primer.

Moving on to Table 4a, here Butterworth's classification can only be verified with respect to the Rouen primer (07). Butterworth (1953: 134) claims that the Rouen primer "actually introduced a new translation of nearly all the Psalms it used. Thus, the Rouen primer cut loose from the tradition of Joye and Marshall, and based its version, with conservative

²¹ One can come across remarks in the literature mentioning Mary's attempt at emphasising continuity with her father Henry VIII (Wooding 2006 [2016: 232-233]). This, however, would imply that Marian primers only printed the Henrician text of the psalms, which, as we have seen, is not the case, for one thing because Mary's primers tend to present two variant texts of psalm 129.

fidelity, on the accompanying Latin text in its margin". At first glance, this stands in contradiction to the results of cosine similarity measurement, which pinpointed Joye's 1534 translation (03) as the source of Psalm 129 in the Rouen primer (0.994-0.997). However, as it appears, Butterworth's conclusions exclude two of the Penitential Psalms, which he shows to derive from Joye's 1534 version.²² Psalm 129 is one of them (Butterworth 1953: 135).

As for Table 5a, which shows the lineage of Psalm 129 in as many as six manuals, only one of them is covered by Butterworth's study. In particular, Butterworth says that the 1539 *Manual* contains two versions of Psalm 129 in three occurrences: it first appears in the section with the Seven Psalms, and, this rendition derives from the 1538 Redman primer (Butterworth 1953: 187-188), while the rendition occurring in the Fifteen Psalms and the Dirge comes "partly from Coverdale and partly from Redman" (Butterworth 1953: 188). This is confirmed by our data, with similarity scores of the first occurrence of Psalm 129 in the *Manual* (09) (cf. 1a above) to Redman's primer of 1538 (cf. 3a below) at the level 0.99.²³ The second and third occurrences of Psalm 129 in the *Manual* (09) (cf. 1b-c) show similarity to Redman's primer at the level of 0.95 and to Coverdale (06; cf. 3b below) at around 0.9, indeed representing a combination of the two renditions. As a textual examination shows, the first two and a half verse in (1b) and (1c) come from Coverdale's version shown in (3b) below, where the part borrowed into (1b) and (1c) is marked in bold. The remaining verses of (1b) and (1c) clearly follow Redman's text given in bold in (3a) below.

- (3) a. 1538 edition of Redman's Primer (STC 16008)_1st occurrence
 FRom the deepe places, haue I called vnto the (oh lorde) lorde heare
 my voyce.
 Let thyne eares be intentife, to *the* voyce of my prayer.
 If thou (lorde) wylte loke so straytly vpon synners, **o lorde, who shall
 abyde it?**

²² While it is interesting in itself why the compiler decided on this particular psalm selection, the answer to this question falls beyond the scope of the present paper. What is crucial for our research is that the applied methodology produces results which correctly reflect the perceived textual affinities.

²³ Because Butterworth (1953: 188) explicitly refers to Redman's 1538 text, we provided here the 1538 version but it is identical with Redman's 1537 text except for the spelling differences, abbreviations and punctuation, which are naturally excluded from similarity measures. Hence, all measurements presented for Redman's 1537 edition (08) are applicable to the 1538 version.

But there is mercye with the: *and* bycause of thy lawe, haue I abyden the, o lorde.

My soule hath abyden in his worde: my soule hath trusted in the lorde.

From the morning watche vnto night: let Israel truste in the lorde.

For with the lorde there is mercye: and his redemption is plentuous.

And he shal redeme Israel, from all the iniquities of it.

b. 06_1535 Coverdale's Bible (STC 2063)

OVt of the depe call I vnto the (o LORDE) LORDE heare my voyce.

Oh let thine eares considre well the voyce of my complaynte.

Yf thou (LORDE) wilt be extreme to marcke what is done amysse. Oh LORDE, who maye abyde it?

But there is mercy with the, that thou mayest be feared.

I loke for the LORDE, my soule doth wayte for him, and in his worde is my trust.

My soule doth patiently abyde the LORDE, from the one mornynge to the other.

Let Israel trust in the LORDE, for with the LORDE there is mercy and plenteous redempcion.

And he shal redeme Israel from all his synnes.

As for Henry VIII's primer (14), Butterworth (1953: 261) states that it mostly utilised the psalms from Redman's primer of 1537 (08). This converges with our results. However, Butterworth (1953: 261) further explains that Redman's 1537 primer offers an emended version of the Rouen primer from 1536 (07). This stands in contrast to the data obtained in our study: the similarity score between Redman's primer (08) and the Rouen primer (07) is 0.815-0.821. The striking differences between the two texts can be appreciated by comparing (4a) with (4b) below.

(4) a. 08_1_1537 edition of Redman's Primer (STC 15997)_1st occurrence²⁴

FRom the depe places, haue I called vnto *the* (o lord) lord here my voyce.

²⁴ As already noted, the Rouen primer prints Psalm 129 three times in almost identical versions (with similarity scores between these occurrences at 0.997-1.0). So, we quote here only the first occurrence of Psalm 129.

Let thyn eares be intentife, to the voyce of my prayer.
 If thou (lorde) wylte loke so straytly vpon synners: o lorde, who shall abyde it?
 But there is mercy *with* the: and bicause of thy lawe, haue I abyden the, o lorde.
 My soule hath abyden in his worde: my soule hath trusted in the lorde.
 From the morning watche vnto night: let Israel truste in the lorde.
 For with the lorde there is mercy: and his redemption is plentuous.
 And he shall redeme Israel, from all the iniquities of it.

b. 07_1_1536 Primer from Rouen (STC 15993)_SEVEN PSALMS
 OUt of the botomles pytte of my heuy trouble I call vnto the / oh Lorde: Lorde heare my prayour.
 Let thy eares be attente vnto the voyce of my complaynt.
 For if *thou* lorde / imputest mens synnes vnto them / lorde who shall nat fall?
 But thou arte merciful and easy to entreate: that we myght reuerence and feare the.
 The lord is my hope vnto whom my soule cleaueth / and I beleue his worde.
 My soule is sette vpon the lorde, frome the one mornynge watche vnto the other.
 Let Israell trust vnto *the* lorde, for with *the* lorde is there bothe infinite mercy and plentuous redempcyon.
 For it is he that redemeth Israel from all theyr synnes.

As transpires from the above, Butterworth's claim that Redman's (08) primer offers a slightly emended text of the Rouen primer (07) is incorrect with respect to Psalm 129 because the two texts are very different.

The textual affinities expressed in Table 6a, i.e. the indebtedness of Psalm 129 in the two version of the *Book of Common Prayer* (1549 and 1552, i.e. 16 and 18 respectively) are confirmed by Jacobs (2013) and Daniell (2003). Jacobs (2013: 182) states that the psalms in the *Book of Common Prayer* came from Coverdale's second translation of the Bible and this textual choice in the case of psalms (in contrast to other scriptural material) remained

unchanged in all subsequent revisions of the *Book of Common Prayer* until the 1960s (Daniell 2003: 189).²⁵

5. Conclusion

Two major objections could be raised against the analysis presented in this paper and we would like to address them here because we voiced them ourselves while working on this project. First of all, it could be said that the study is based on too small a sample of data to warrant reliable conclusions; secondly, that the cosine distance scores express what we can see with the naked eye, so why complicate things by introducing mathematical values, whose immediate significance has to be learned before it can be of any use.

There are two points we would like to make with reference to the first objection. Firstly, let us emphasise that whatever conclusions were drawn from the analysed texts concerned only the texts that constituted the focus of this study, i.e. Psalm 129 as contained in the analysed publications. We have not made any generalised claims with respect to any other texts contained in the devotional manuals we examined, though, of course the achieved results may be treated as an implication as to the source of other psalm versions. This, however, is not a drawback of our study. On the contrary: it can direct further research in an informed way. Secondly, on the practical side of the cosine similarity measurement, it has been shown independently (cf. Charzyńska-Wójcik in prep.) that cosine measurements performed on bigger samples of data which show a propensity for repeated vocabulary, as psalms certainly do, are best performed on small chunks of text, as feeding big portions of text into the calculation does not produce the same overall result as the medium of the sums of the scores for small portions of texts. This prompts the necessity of working on small textual units and most psalms represent such units. In effect, the small size of the analysed text does not adversely affect the achieved results.

When it comes to the second objection, i.e. that the cosine similarity scores express what we can see with the naked eye, we also have two counterarguments to offer. Firstly, notice that it does not in fact constitute a shortcoming that a mathematically expressed similarity score *repeats* what we can see on the basis of our philological examination; far from it, though

²⁵ An examination on the provenance of Psalm 8, which also relied on cosine similarity shows the similarity of Psalm 8 printed in these two sources at the level of 0.993 (Charzyńska-Wójcik 2021).

the ultimate gain is not immediately visible in extreme cases. In particular, for identical or near-identical texts we do not need to rely on cosine distances. Similarly, we do not seem to require assistance in expressing the observation that two texts are different. We can describe two texts as (almost) identical or (completely) different. However, when it comes to comparing *how* different or *how* similar *several* texts are to each other, we face three problems. One of them is related to perception, one to description, and one to methodology. Let us begin with the first of them.

While we can state the degrees of mutual similarity with respect to a small closed set of texts, say four or five, when more elements are added to the compared set, the degrees of relatedness have to be established anew because they were expressed relationally, with no objective values assigned to them. This effect is avoided when textual relatedness is expressed by mathematical similarity scores. No matter how many other texts are added into the compared set, the similarity values calculated for the original set remain stable, even if we need to make room for the added texts in the established similarity hierarchy. Crucially, adding a text to the compared set will never result in a researcher having to reformulate their observations because they are expressed in objective mathematical terms. This contrasts with the situation in which comparison relies on purely relational assessments. In particular, if in a pool of texts some texts cluster together and one stands out as visibly different from the rest, we will conclude that the texts are all related, except for this one, which we will call “very different”, “unrelated”, “independent” or “original”. However, extending the compared set by a text which shows some similarities to both the texts that clustered together and the one which stood out will inevitably require restating the conclusion with respect to the text which was originally classified as “independent”. This is caused by the way we perceive differences and similarities: relationally. And that is also how we express them, which brings us to the second point raised above: what we have at our disposal to *describe* the observed differences.

All too often in the literature do we come across claims expressed with respect to the same psalm translations by different researchers articulating the mutual relationship of these texts in terms of revisions, deep revisions, or calling them practically new translations. Similarly, at the other end of the scale, the same texts are described by different scholars as identical, while others see them as the same text printed with only minor modifications, or speak of the later text as a slightly revised version of the former (cf. Charzyńska-Wójcik 2021 for concrete examples). In effect, it is not very far from “slightly revised” to “revised”, while the linguistic reality behind

this apparent similarity may be very different. This inevitably introduces confusion and does not contribute to propelling our knowledge of psalm translations and their revisions.

With reference to the methodological problem signalled above, let us note that, as has been indirectly intimated above, while all linguistic differences between compared texts can be spotted, catalogued and counted, there is no obvious way of actually assessing them, not only because vocabulary that is accurate enough is missing but also because it is not obvious how to classify omissions with respect to additions or replacements. In particular, while it seems clear that diverging word choices need to be classified as textual differences, and neither is the source text consulted in such cases nor is the difference evaluated in any way in assessing text similarity, it is not immediately obvious how to approach instances where one text exhibits an item which is missing from another one. For one thing, to classify such instances, one would have to consult the source to determine whether we are dealing with addition or an omission. Omissions may result from the imperfections inherent in the copying process and in some cases this is clearly what has happened (especially if function words are missing). In contrast, additions require a different approach and, therefore, different classifications. Problems of this type do not arise when a researcher may avail themselves of objectively computed mathematically expressed scores of similarities.

It is hoped that the arguments presented above have not only dispelled any potential initial doubts as to the usefulness of the applied method, but have – in fact – spoken strongly in favour of it. To these advantages, we can add the practically unlimited number of texts that can be covered by a comparison, as we have done here with 30 texts, which would admittedly be hard to compare without reliance on the applied method. Finally, let us add that the software necessary to perform text similarity measurement is freely available, while the number of texts available in Text Creation Partnership is increasing rapidly, contributing to the growing applicability of this method by eliminating the need to prepare transcripts of the compared texts.

On a more general plane, the examination presented in the paper shows that English devotional practices in the turbulent period when they were emerging were much more complex than the purely denominational differences between Catholics and Reformers (often misconceived from the present-day perspective) might suggest. The shared texts of the psalms and unexpected continuities show the heterogenous character of the devotional manuals reflecting the power of the psalms to bridge confessional divides.

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Address: MAGDALENA CHARZYŃSKA-WÓJCIK, Nanovic Institute for European Studies Keough School of Global Affairs University of Notre Dame, 1060 Nanovic Hall, Notre Dame, Indiana 46556-7000, USA and Department of the History of English and Translation Studies, John Paul II Catholic University of Lublin, Al. Raławickie 14, 20-950 Lublin, Poland.
 ORCID code: 0000-0002-8789-8989.

Address: JERZY WÓJCIK, Department of English-Polish Contrastive Studies, John Paul II Catholic University of Lublin, Al. Raławickie 14, 20-950 Lublin, Poland.
 ORCID code: 0000-0001-5283-9017.