

# The colourful causal construction. A corpus-based cross-linguistic analysis of its form and function in Dutch, English and French

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## Abstract

Previous research has shown that colours are used in many languages to express emotions. This study aims to provide a cross-linguistic constructional analysis of the Colourful Causal Construction (CCC) (e.g., *she is red with anger*) in which colour-emotion associations play a central role. A corpus study was conducted using the TenTen web corpora to investigate the formal variation and the lexical-semantic features of this construction in Dutch, English and French, as well as its productivity and potential for intensification. Results show that the CCC fits a similar semi-schematic pattern in the three languages under study. All three languages share the same top three of lexical fillers in the colour slot, namely *red*, *green* and *white*, and the construction expresses a literal/metonymic meaning in approximately 50% of the cases across the three investigated languages. Some colour-emotion associations are shared and used with similar frequencies in all three languages (e.g., *red with shame*, *rood van schaamte*, *rouge de honte*), but striking language-specific preferences also exist (e.g., *red with rage*, *rood van woede* vs. *vert de rage*). In terms of productivity, some colours (e.g., *red*) impose few semantic restrictions on the emotion-nouns they combine with and hence correlate with a relatively high number of emotion-nouns, while others are only found in fixed collocations (e.g., *blue with cold*). Moreover, the study suggests that the CCC should be considered a language-specific means of (partially) lexicalized intensification.

**Keywords:** Colourful Causal Construction, colour-emotion associations, Construction Grammar, cross-linguistic analysis (Dutch, English, French), intensification

## Résumé

Des recherches antérieures ont montré que les couleurs sont utilisées dans de nombreuses langues pour exprimer des émotions. Cette étude vise à fournir une analyse constructionnelle translinguistique de la Construction Causale de Couleur (CCC) (p. ex., *elle est rouge de colère*)

dans laquelle les associations couleur-émotion jouent un rôle central. Une étude de corpus a été menée à l'aide des corpus web TenTen afin d'examiner la variation formelle et les caractéristiques lexico-sémantiques de cette construction en néerlandais, anglais et français, ainsi que sa productivité et son potentiel d'intensification. Les résultats montrent que la CCC forme une construction semi-schématique similaire dans les trois langues étudiées. Les trois langues partagent le même trio de tête de couleurs dans la CCC, à savoir *rouge*, *vert* et *blanc*, et la construction exprime un sens littéral/métonymique dans environ 50% des cas dans les trois langues étudiées. Certaines associations couleur-émotion sont partagées et utilisées avec des fréquences similaires dans les trois langues (p. ex., *red with shame*, *rood van schaamte*, *rouge de honte*), mais il existe également des différences translinguistiques frappantes (p. ex., *red with rage*, *rood van woede* vs. *vert de rage*). En termes de productivité, certaines couleurs (p. ex. *red*) imposent peu de restrictions sémantiques aux noms d'émotion avec lesquels elles se combinent et sont donc corrélées à un nombre relativement élevé de noms d'émotion, tandis que d'autres ne se trouvent que dans des collocations figées (p. ex. *blue with cold*). En outre, l'étude suggère que la CCC devrait être considérée comme un moyen d'intensification (partiellement) lexicalisée spécifique à la langue.

**Mots-clefs** : *Colourful Causal Construction* (Construction Causale de Couleur), associations couleur-émotion, Grammaire de Construction, analyse cross-linguistique (néerlandais, anglais, français), intensification

## 1. Introduction

There are many ways in which people can express their feelings or emotions, some of which can be very creative; the use of colour terms is a case in point. Previous research has indeed shown that colours form a resourceful domain of expression, especially through their associations with specific emotions, which can arise via several cognitive processes (Soriano & Valenzuela, 2009, see Section 2.2). This is the case for the so-called Colourful Causal Construction (henceforth CCC), such as *he is green with envy*, in which a colour term (*green*) is combined with an emotion (*envy*) to refer to a person's emotional state (De Knop, 2013).

De Knop (2014) even argues that CCCs are used to highlight an extreme emotional state, which suggests that such expressions have great potential for intensification. This type of evaluative language refers to the expression of a speaker's (positive or negative) feelings towards a quality, based on subjective, individual criteria (Grandi, 2017a, p. 8). In other words, intensification indicates the position of a quality on a scale which diverges from the norm, whether positively or negatively (Van der Wouden & Foolen, 2017). As far as the construction under study is concerned, this implies that someone who is said to be *red with shame* is considered to experience this emotion to a high degree.

However, the cross-cultural nature of the colour-emotion associations the CCC is based on is disputable. As Soriano and Valenzuela (2009) have shown, cross-cultural differences in the way colours and emotions are combined may emerge due to variation in connotation of colour concepts and implicit associations. This, in turn, leads to cross-linguistic differences: one colour may be associated with a specific emotion in one language (and vice versa) but not in another. For instance, De Knop's (2014) study of the CCC in French and German shows that, although jealousy and envy are similar emotions, French speakers tend to associate jealousy with green (*vert de jalousie* 'green with jealousy'), while German speakers prefer to combine envy with yellow (*gelb vor Neid* 'yellow with envy'). Considering that the CCC is used in many languages – including English (Sandford, 2014), German (De Knop, 2014), French (De Knop, 2014), and Italian (De Knop & Mollica, 2014) – these findings make us wonder which features may be shared across languages and which language-specific peculiarities characterize the CCC in a variety of languages. Yet very few studies have looked at this construction from a contrastive point of view (exceptions are De Knop, 2014 and De Knop & Mollica, 2014). Moreover, so far, no study has included Dutch as one of the main languages of interest. Previous research on the potential for intensification in the Dutch language has also been limited to specific constructions, without – to the best of our knowledge – paying close attention to the role of colours (Cappelle, 2014; Gyselinck & Colleman, 2016; Hendrikx, 2019, amongst others).

Using the framework of cross-linguistic Construction Grammar (Boas, 2010; Hoffmann & Trousdale, 2013, among others), the present study aims to analyse the CCC in three different languages, namely Dutch, English, and French<sup>1</sup>. On a general level, it aims to contribute to the limited existing body of research in contrastive Construction Grammar (see Boas, 2010, amongst others). In order to do so, we wish to address three more specific research questions:

- i. To what extent does the CCC allow for formal and lexical-semantic variation?
- ii. Are the colour-emotion associations in the CCC language-specific or shared in Dutch, English and French?
- iii. To what extent can the CCC be used to express intensification?

The first question focuses on the degree of formal and lexical-semantic variation found in this construction in the three different languages under study. In addition to this, we look at how this variation is reflected in the productivity of the CCC. Depending on how the various empty

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<sup>1</sup> The present article is based on a larger project conducted as part of the first author's Master's thesis (Poncin, 2021) under supervision of the second author.

slots of the CCC are filled, we expect that it shows more or less variation, and therefore a higher or lower degree of productivity.

The second aim is to investigate the shared or language-specific nature of colour-emotion associations used in the CCC. Even though the three languages under study belong to the Indo-European language family and are typologically closely related, rooted in Western culture, they might not always overlap in terms of colour-emotion associations. Based on the previous literature (Soriano & Valenzuela, 2009; De Knop, 2014; Sandford, 2014), we expect to find differences between Dutch, English, and French, due to cross-linguistic differences in colour-emotion associations, that in turn lead to differences in productivity.

The third question pertains to the expression of intensification and the extent to which the CCC has potential for intensification. We hypothesise that the CCC has such potential, based on De Knop's (2014) observation that the CCC is semantically similar to German intensifying compounds in terms of their expression of exaggeration and excess (see Section 2.3). The variation and productivity exhibited by the construction would make it possible to express high degrees of emotion, be it in conventionalized or more creative manners.

The outline of the paper is as follows. Section 2 provides an overview of the literature about the CCC and of relevant cognitive and constructionist insights into this pattern. Section 3 then gives a comprehensive account of the methods of data selection and analysis used for this study. The results are presented in Section 4 and further discussed in Section 5, before we turn to the conclusion.

## 2. Theoretical framework

This study is framed within the theory of Construction Grammar and applies insights from previous research on the cognitive dimension of colour-emotion associations and on the expression of intensification. Section 2.1 deals with Construction Grammar (among others, Goldberg, 1995, 2006, 2019; Hoffmann & Trousdale, 2013; Verhagen, 2005) and the relevance of constructional concepts such as schematicity and productivity for the construction under study. Section 2.2 then provides a short summary of previous research on colour-emotion associations applied to the CCC (De Knop, 2014) and in cognitive linguistics more generally (Soriano and Valenzuela, 2009). Lastly, Section 2.3 defines intensification (Napoli & Ravetto, 2017; Grandi, 2017a, 2017b, among others) and further elaborates on how this semantic aspect may be relevant to the CCC.

## 2.1. Construction Grammar

### 2.1.1. Schematicity and productivity

As its name suggests, the CCC can be considered a ‘construction’ in Construction Grammar terms. This framework commonly defines constructions as conventionalized form-meaning pairings which constitute the basic units of language (Goldberg, 1995, 2006, among others). Construction Grammar posits no strict division between lexicon and grammar, viewing language as “simply made up of constructions existing at all levels of language” (Barðdal, 2008, p. 4). Constructions therefore range from lexical (substantial) to syntactic (schematic) and “differ in internal complexity”, but “both [...] are essentially the same type of declaratively represented data structure: both pair form with meaning” (Goldberg, 1995, p. 7). An important parameter in the definition of constructions is the ‘principle of non-compositionality’, as formulated by Goldberg (2006, p. 5): “[a]ny linguistic pattern is recognized as a construction as long as some aspect of its form or function is not strictly predictable for its component parts or from other constructions recognized to exist”. In a strict sense, this means that constructions must be unpredictable and fully idiosyncratic, but this does not necessarily hold true for all constructions. For that reason, an additional factor called ‘entrenchment’ plays a major role in the identification of constructions. This concept suggests that “patterns are stored as constructions even if they are fully predictable as long as they occur with sufficient frequency” (Goldberg 2006 p. 5).

Constructions, as the basic units of language, form a network of interrelated knowledge called the “Constructicon” (Fillmore, 1988; Fillmore and Kay, 1996; Goldberg, 2006; Tomasello, 2003, among others). In this network, constructions are related hierarchically via inheritance links which “capture the fact that all nonconflicting information between two related constructions is shared” (Goldberg, 1995, p. 75). Such a network is assumed to emerge in a bottom-up fashion, i.e., the specific patterns give rise to the abstraction of more schematic patterns. Inversely, one general pattern may be linked to several more specific patterns with their own characteristic features in addition to the formal and/or semantic properties they inherit from their parent construction.

One of these characteristic features may be the number of fixed and variable components present in a pattern. Fixed elements cannot be changed, whereas empty slots can be filled in with various lexical items, though the choice of filler may be constrained by formally or semantically motivated factors. These constraints account for (partial) productivity, i.e., the degree to which the pattern allows for variation. Constructionists represent the concept of

schematicity as a continuum of constructions ranging from fully fixed substantial constructions (or idioms) in which all slots are fixed (e.g., *to kick the bucket*) to fully open schematic constructions, such as the ditransitive construction in which no slot is pre-specified ([Subj V Obj<sub>1</sub> Obj<sub>2</sub>], e.g., *he baked her a birthday cake*). So-called semi-schematic constructions stand between these two poles. The latter are patterns with one or more empty slots that can be filled within certain (formal and/or semantic) constraints, such as the covariational conditional [*the Xer the Yer*] (e.g., *the older you get, the less sleep you need*). Verhagen (2005), for instance, further describes such semi-schematic constructions as semi-productive: even though a semi-schematic pattern is stored in the Constructicon and can therefore be creatively used to produce all sorts of new expressions, this creative use strongly depends on the construction-specific restrictions that must be respected. Nevertheless, Verhagen underlines that some commonly used, more concrete instances of semi-productive constructions may also (substantially) be stored in the mental Constructicon. For instance, the Dutch construction *een schat van een kind* (lit. ‘a treasure of a child’) constitutes a stored instance of the (productive) general pattern [Det N<sub>1</sub> *van (een)* N<sub>2</sub>] which conveys that N<sub>2</sub> exhibits characteristics of N<sub>1</sub> to an extraordinary extent (Verhagen, 2005, p. 202). Besides this ‘fixed’ instance, the pattern can be used in creative ways to refer to a wide range of persons, animals or objects, as in *die kast van een woning* (lit. ‘this closet of a house’, i.e., ‘this huge house’).

### 2.1.2. The Colourful Causal Construction

De Knop and Mollica (2014) affirm that the CCC is a well-established and productive syntactic pattern cross-linguistically. This pattern can be visualized in (1), and the sentences in (2) illustrate its application in English (2a), Dutch (2b) and French (2c).

(1) [NP<sub>subject</sub> + V + [Adj<sub>colour term</sub> + Prep<sub>causal</sub> + N<sub>emotion</sub>]]

- (2) a. He is **green with envy**  
 b. Hij is **groen van nijd**  
     ‘He is green with envy’  
 c. Il est **vert de jalousie**  
     ‘He is green with jealousy’

As shown in (1), the CCC is made up of empty slots, namely the noun phrase (NP) referring to the subject, the verb (V), the colour adjective (Adj), the preposition (Prep), and the noun (N) expressing the emotion. However, as we will see below, the prepositional slot is fixed in various languages, which motivates us to consider it a semi-schematic construction.

In this construction, a colour term functions as the expression of (change in) an emotional state. Previous studies have often limited the analysis to the “Basic Color Terms” (BCTs) of Berlin and Kay (1969), more specifically the primary BCTs (*black, white, red, yellow, green, blue*) since the secondary terms (*brown, purple, pink, orange, grey*) would be much less commonly used in the CCC (De Knop, 2013, 2014).

There are four other empty slots besides the colour adjective, the first one of which is the subject that undergoes the (change of) emotional state. Although this subject often refers to an animate, living being (or its face), it may also be inanimate. This is possible through personification, i.e., the attribution of human characteristics to an inanimate subject (De Knop, 2013). This is, for instance, the case of the sky in example (3) (De Knop, 2013, p. 116).

- (3) Dehors sous le ciel gris de rage contenu [...]
   
‘Outside under the sky grey with contained rage [...]’

Previous studies show that copula verbs fill the verb slot in most cases (for French, see De Knop, 2013, 2014, and De Knop & Mollica, 2014; for English, see Sandford, 2014; for Dutch, see Broekhuis, 2013). For the English CCC, Sandford (2014) argues that a distinction should be made between the use of the “static” copula verb *to be* and “dynamic” copula verbs such as *to become, to turn, to go* and *to grow* which indicate a change of state<sup>2</sup>. It remains unclear whether other (lexical) verbs can similarly act as copula verbs in the CCC in Dutch and French<sup>3</sup>.

Moreover, the CCC expresses causality, i.e., “the association of causes, motives and reasons with their corresponding consequences, effects and implications” (Ballestracci, 2011, cited in De Knop, 2013 p. 1). The cause for the change in emotional state is introduced by the (causal) preposition. Previous research shows that the German CCC allows for several possibilities to fill this slot (*vor, von*), which is also the case in English (*with, from, (because) of*) but not in French (*de*). In Dutch, only the preposition *van* ‘of’ can be used in this construction (Broekhuis, 2013). Just like *with* in English, which typically expresses comitative use and not causality,

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<sup>2</sup> Sandford chooses to separate the more general pattern [X [BE] Y with Z] from the second pattern [X [BECOME] Y with Z] due to the underlying conceptual metaphor CHANGE IS MOTION “that marks a shift from a static concept image (*to be*) to a dynamic concept image (*to become/go/turn/grow*)” (Sandford, 2014, p. 69).

<sup>3</sup> Poncin (2021) studies the different types of verbs that can be used in the V-slot, but this discussion goes beyond the scope of the current paper.

this causal use of *van* constitutes a special case. A more typical causal preposition in Dutch would be *door* ('by'), which however never appears in the Dutch CCC. Thus, when it comes to the prepositional slot, in at least two of the three languages under study (French and Dutch), the CCC is not entirely schematic, but partially fixed. However, in spite of the possible variation in the English prepositional slot, the present study limits its scope to English occurrences using *with*, the most frequent preposition in this specific construction (De Knop, 2014; Sandford, 2014).

The preposition introduces a prepositional phrase, including a noun referring to an emotion. In our study, we include both mental emotions (e.g., jealousy) and physical feelings (e.g., cold). The emotion-noun may also point to an external and often extreme cause (De Knop, 2013, p. 116; De Knop, 2014). For example, a sentence such as *Her hands are blue with cold* indicates the consequence of very low temperature.

## 2.2. Colour-emotion associations

The study of colour-emotion associations is not entirely new. In the '80s, Bennett (1988) showed that some of these associations could be shared across languages. In his analysis of English colour collocations and idioms, Bennett demonstrated that colours could be used to describe a variety of phenomena (including emotions) thanks to so-called "inter-sense correspondences", i.e., "the possibility that other elements such as emotions are also, on occasions, perceivable or describable in terms of colour" (Bennett, 1988, p. 136). For instance, the colour *black* in the phrase *a black look* metaphorically "recalls the threat, contained in dark thunderclouds, of lightning, thunder, downpour and other unpleasant things" (Bennett, 1988, p. 22). Such inter-sense correspondences can be shared across languages, like the association of 'fear' with the colour *blue* in the English expression *a blue funk* and its French equivalent *une peur bleue* (lit. 'a blue fear'). Bennett (1988) posited that these expressions could either be related through translation or have developed separately. Whatever the reason for similarity, the use of the same inter-sense correspondence of *blue* in both languages indicates that the choice of colour in either expression is not entirely arbitrary.

However, one colour term does not necessarily call up the same associations across different languages, as demonstrated within the framework of cognitive linguistics (e.g., Adams & Osgood, 1973; Osgood, May & Miron, 1975). These associations can be either idiosyncratic or shared, as attested by Soriano and Valenzuela (2009) in their study of the connotations and implicit associations of Spanish colour terms. The authors distinguish four

complementary cognitive processes underlying such associations, which we briefly present in the remainder of this section.

The first process is that of conceptual metonymy, a ‘part-for-whole’ or ‘cause-for-effect’ relationship that motivates expressions in which an entity is referred to by means of another related entity (Soriano and Valenzuela, 2009, p. 423). Conceptual metonymies of colour and emotion motivate associations between colour terms and emotions by using the colour term to refer to the cause of the emotion rather than the effect; such a cause tends to be a bodily fluid produced during an emotional experience (Soriano & Valenzuela, 2009; Sandford, 2014; De Knop, 2013, 2014; De Knop & Mollica, 2014). In the case of *red with anger*, for instance, the colour term *red* is related to blood, the bodily fluid playing a physiological role in the experience and expression of anger (for example, when someone’s face literally turns red when he/she is angry). Yet Soriano and Valenzuela (2009, p. 423) emphasise that, although emotional physiology is roughly the same for all people, we cannot expect all cultures and languages to choose the same colour in relation to one specific emotion. There are two reasons for this. The first one is that one and the same emotion has different colour aspects, and each culture chooses only one aspect of this multifaceted reality. For instance, English speakers may use blushing (*she is red with rage*) to refer to anger (Soriano & Valenzuela, 2009, p. 423). A second reason is related to culture-specific physiological theories: for example, *envy* is often associated with bile and thus with green and yellow in Western cultures (Ogarkova, 2007, cited in Soriano & Valenzuela, 2009, p. 423).

The second cognitive process which may motivate colour-emotion associations is that of the conceptual metaphor. In this case, a target domain is conceptualised in terms of a source domain based on what one knows about the source domain (Lakoff & Johnson, 1980; Tribushinina, 2008; Soriano & Valenzuela, 2009)<sup>4</sup>. As an illustration, Soriano and Valenzuela (2009, p. 424) mention the associations of envy with black and white in Russian: on the one hand, *black envy* (i.e., ill-wishing envy) refers to the association of black with evil conceptualised through the metaphor BAD IS BLACK, while on the other hand the concept *white envy* as a type of “envy that is not malicious” is motivated to the conceptual metaphor GOOD IS WHITE.

Thirdly, Soriano and Valenzuela (2009) claim that colours themselves may trigger emotional reactions that can explain the way colour and emotions are associated. In line with Goldstein (1942), Soriano and Valenzuela demonstrate that the perception of colours leads to

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<sup>4</sup> See also Kövecses (2000) for a more detailed analysis of the cross-linguistic mapping between emotion concepts and wide-spread metaphorical patterns (beyond colour idioms).

some physiological reactions anchored in psychological experiences. It has been shown, for example, that the colour *red* triggers feelings of alertness, a state which, depending on the situation, can be either favourable or unfavourable (Elliot et al., 2007; Mehta & Zhu, 2009). This may be the reason some languages have positive associations with red (e.g., *love*), while others have negative ones (e.g., *anger* in English, Spanish, Italian and German, and *shame* in Italian, English, Spanish and French) (Soriano & Valenzuela, 2009, p. 424).

The fourth process is that of shared connotative structures between colours and emotions. Soriano and Valenzuela (2009) put forward that colours and emotions can share the same or similar connotations. This means that colour terms reflect more than a visible and perceivable aspect in the real world and, in addition to mere denotation of a chromatic aspect, also carry an emotional load, especially through associations rooted in human experience. Such associations can nevertheless differ from culture to culture – and thus from language to language. Soriano and Valenzuela (2009, p. 425) illustrate this phenomenon by elaborating on the association between the colour *red* and blood: as a concept, blood has certain affective values and can therefore symbolise danger in one culture and life in another, values which the colour *red* can inherit. While this fourth motivation bears similarity to Bennett's (1988) inter-sense correspondences, Soriano and Valenzuela (2009) underline the existence of cross-cultural differences as they note that considerable variation may arise across languages. However, they do also note that both elements in a colour-emotion pairing shared across languages always share some considerable overlap in how they are evaluated by speakers of these languages. For instance, if a colour is regarded as good and strong instead of bad and weak, it is likely to be associated with an emotion that is also perceived as good and strong (Adams & Osgood, 1973 and D'Andrade & Egan, 1974, cited in Soriano & Valenzuela, 2009).

Turning to the processes involved in constructing the meaning of the colour adjective in the CCC, studies describe three ways in which this adjective can be read: literally, metonymically, or metaphorically (De Knop, 2013, 2014; De Knop & Mollica, 2014). Firstly, a literal interpretation of the colour term applies to instances such as *haar handen zijn rood van de kou* in Dutch ('her hands are red with cold'): in this case, the colour *red* is used to refer to the actual colour of the hands. Other instances of the CCC can be understood metonymically, such as *green with envy* and *red with anger*. De Knop (2013) explains these combinations using the conceptual metonymy COLOUR OF THE FACE FOR PHYSICAL STATE and referring to the work of Soriano and Valenzuela (2009): external factors or emotions cause a specific bodily fluid to rise in the body, which becomes visible on a body part that is often the face. While colour terms such as *green* and *yellow* (when used in the CCC) do not refer to any

literal change in colour on the face, this is the case when someone becomes *red with anger*. Nevertheless, the mention of one aspect of a situation – the actual colour of the face (e.g., *red*) or a rising bodily fluid (e.g., blood for *red*; bile for *green*) – to describe the whole emotional state of the subject (e.g., anger; envy) in each of these instances renders the use of each colour metonymic. Thirdly, De Knop (2013) uses the French phrase *je suis rose de bonheur* (‘I am pink with happiness’) to illustrate a metaphoric reading of the CCC. In this example, the colour *pink* does not refer to either an actual colour change or a bodily fluid, but rather metaphorically conveys the idea that the subject is experiencing an extreme amount of happiness (cf. the expression *la vie en rose*).

To summarise the overall functioning of the CCC, Figure 1 shows the schematic instantiation of the CCC and the inheritance links to the three different sub-patterns referring to three possible readings.

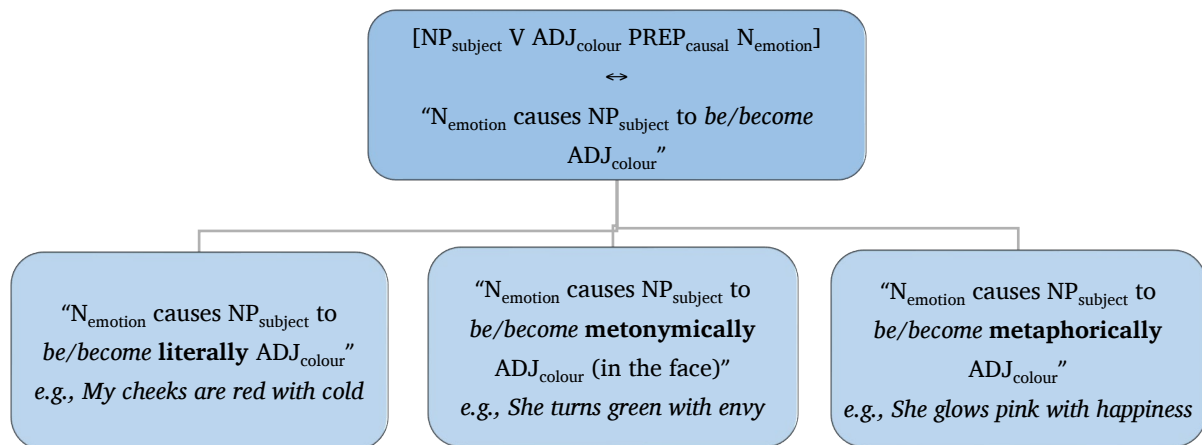


Figure 1. Constructional network and inheritance links of the CCC

### 2.3. Intensification

Intensification can be defined as a qualitative form of evaluative language which expresses a speaker’s feelings towards a quality based on subjective, individual criteria (Grandi, 2017a, p. 8). This type of evaluation indicates that/how the value of an entity diverges from the ‘normal’ value, whether positively or negatively (Van der Wouden & Foolen, 2017). All intensifying strategies thus express some deviation from the prototypical referent, i.e., they express some level of positively or negatively intensified meaning.

While some linguists advocate the recognition of a wide range of intensifying strategies (Napoli & Ravetto, 2017), the two most frequently discussed types of intensifiers are

morphological and syntactic intensifiers. Firstly, augmentative compounds such as Dutch *doodmoe* (lit. ‘dead tired’) and English *ice cold* qualify as morphological intensifiers, in addition to intensifying prefixes (e.g., *hypersensitive*) and suffixes (e.g., Italian *bellissimo* ‘very beautiful’). Intensifying compounds are not used in all languages with the same frequency. For example, such compounds are less productive in French than in Dutch and English (e.g., Hendrikx, Van Goethem & Wulff, 2019). Secondly, the category of syntactic intensifiers is highly productive across languages and includes – but is not limited to – degree adverbs (e.g., Eng. *very*, Dutch *heel*, French *très*) and prepositional phrases (e.g., *to a high degree*) (Quirk et al., 1985; Napoli & Ravetto, 2017). Interestingly, Grandi (2017b) points out a specific kind of syntactic intensifier, namely intensifying lexicalised collocations, which has yet to be investigated in a variety of languages. Using Italian expressions such as *fame da lupi* (lit. ‘hunger of wolf’) and *mangiare come un bue* (‘to eat like an ox’) as examples, the author draws attention to the existence of constructions with a low degree of semantic compositionality but a high degree of internal cohesion for the expression of exaggeration or excess just like other types of intensifiers. In Section 4.3 we will discuss whether the CCC should also be considered such a syntactic intensifying construction.

Building on De Knop’s (2014) claim that the CCC is used to express an extreme emotion, it can be hypothesized that the CCC conveys an intensified meaning. De Knop (2014) provides supporting evidence for this argument by showing that the French CCC in (4a) can be translated into German in two different ways: either by using the CCC (as illustrated in 4b), or by using an augmentative compound (as illustrated in 4c).

- (4) a. Les enfants étaient **bleus de froid**  
 b. Die Kinder waren **blau vor Kälte**  
 Lit. ‘The children were blue from cold’  
 c. Den Kindern war **eiskalt**  
 Lit. ‘To the children was ice cold’ (‘The children were freezing’)

In this paper, we hypothesize that in the CCC, intensification can be seen as the holistic meaning of the construction: this implies that the intensifying value is not expressed separately in any of its slots. This contrasts with other intensifying constructions in which the colour terms themselves are used as intensifiers. Gyselinck and Coleman (2016), for example, discuss the Dutch ‘pseudo-reflexive resultative construction’, in which colour terms act as intensifiers to express a high degree of emotion. A Dutch sentence such as *ik erger me groen en geel* (lit. ‘I annoy myself green and yellow’) implies a high degree of irritation by using *groen en geel* as an intensifier, roughly corresponding to ‘I am very annoyed’. Instead, the CCC might be understood as a holistic intensifying unit, similarly to Grandi’s (2017b) lexicalised

collocations. Unlike these collocations, however, the CCC leaves a certain amount of room for variation due to its considerable number of empty slots. Yet, this does not exclude that a number of specific colour-emotion associations might occur within the CCC with a much higher frequency than others. Such concrete instances may then be subject to substantial storage (cf. Verhagen, 2005 in Section 2.1).

### 3. Methodology

In view of our research aims and questions, a contrastive corpus study was conducted using the TenTen web corpora. Accessible in a variety of languages through SketchEngine (Kilgarriff et al., 2014), these corpora of considerable size (around 10 billion words per language) consist of authentic material gathered from the Internet, where there is plenty of room for (informal) evaluative language (see Jakubíček et al., 2013 for more information on the TenTen corpora). Moreover, these corpora contain recent language data, considering that new material is collected approximately every two years. For each language under study, we used the most recent available version of the TenTen corpus at the time of the data collection, namely the nlTenTen14 for Dutch, the enTenTen15 for English, and the frTenTen17 for French, compiled in 2014, 2015, and 2017 respectively<sup>5</sup>.

Our corpus data was automatically extracted using the Concordance tool on SketchEngine. The platform allows for the use of a range of query types, including more advanced searches using the underlying Corpus Query Language (CQL) (Kilgarriff et al., 2014). The CQL-queries used for this project contained three slots: one for the colour adjective, one for the preposition and a final one for the emotion noun. To limit the presupposed openness of the adjectival slot, this slot was restricted to Berlin and Kay's (1969) primary BCTs, based on De Knop's (2013, 2014) observation that the secondary BCTs were less commonly used in the CCC. The CQL-queries used are presented in (5a–c). By not including the subject and verb slots directly into the queries, we were able to retrieve as many instances of the CCC as possible, even those with a more complex syntax (e.g., subject-verb inversion in 6a) as well as modified and intensified instances (e.g., 6b).

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<sup>5</sup> With respect to corpus size, the English corpus is the largest (13,190,556,334 words), followed by the French (5,752,261,039 words) and Dutch one (2,253,777,579 words).

- (5) a. NL: [lemma = “rood|blauw|groen|geel|zwart|wit”] [word = “van”] [tag = “noun.\*” & lemma! = “kleur”]  
 a’. NL’: [lemma = “blauw”] [word = “van”] [word = “de”] [tag = “noun.\*” & lemma! = “kleur”]  
 b. EN: [lemma = “red|blue|green|yellow|black|white”] [word = “with”] [tag = “N.\*”]  
 c. FR: [lemma = “rouge|bleu|vert|jaune|noir|blanc”] [word = “de”] [tag = “N.\*”]
- (6) a. Toen werd hij **rood van woede** en riep: vijf lagen lippenstift!  
 ‘Then he turned red with rage and shouted: five layers of lipstick!’  
 b. [...] maar ik werd **helemaal wit van schrik**  
 Lit. ‘[...] but I became completely white with fear’

It should be noted that the lemma *kleur* ‘colour’ was excluded from the query in Dutch (lemma! = “kleur” in (5a)) because a brief preliminary investigation revealed an excessive amount of results in which colours were used literally without any colour-emotion association, as in *Wel is geitenkaas witter van kleur dan kaas gemaakt van koemelk* (‘Goat’s cheese is whiter in colour than cheese made from cow’s milk’). Moreover, the additional query in (5a’) was used to include the construction *blauw van de kou* ‘blue with cold’ in the Dutch dataset, in which the determiner *de* is required before the noun *kou*.

In a next step, the downloaded samples had to be manually checked for relevance. For instance, we had to exclude occurrences with colours referring to food names (as in 7) and descriptions of actual colours (as in 8), even though these hits met the requirement of our corpus query.

- (7) Sauteed **greens with garlic**, ginger and soy sauce
- (8) a. Vrolijk stemmende **rood van pinot noir**  
 Lit. ‘Cheerful red of pinot noir’  
 b. Le modèle **noir de jais** est disponible exclusivement en capacités de 128 et 256 Go  
 ‘The Jet Black model (lit. ‘the model black with jet’) is available exclusively in 128 and 256 GB capacities’  
 c. It’s got a stylish look to it and [...] it’s **black with gold** accents

Furthermore, any hit that shared the general structure of the construction but did not include in the PP a noun expressing an emotion was excluded. This meant that “material” causes such as illnesses (9a) and substances (9b) were excluded. However, physical causes such as the cold (10) were retained since they still imply that the subject experiences some sort of emotion or feeling. In other words, three types of causes were included in this study: typical emotions understood as “complex unconscious reaction[s] [...] that [are] dependent on predisposed innate cognitive mechanisms” (Sandford, 2014, p. 70), moods (i.e., emotional states with a lasting effect), and states of being that “may be related to a physical response like hunger or

thirst” (see Sandford, 2014 for a brief discussion of the definitions of emotion, feeling, mood, and state of being).

- (9) a. I was **yellow with hepatitis** and was ready to die  
 b. Olof's vingers zijn **zwart van nicotine**  
 ‘Olof's fingers are black with nicotine’
- (10) Mijn handen zijn nu nog vrij bleek en een beetje **blauw van de kou**  
 Lit. ‘My hands are still quite pale and a bit blue from the cold’

Using these criteria, we ended up with a total of 272 occurrences of the CCC in Dutch and 245 in English, but only 78 in French. Surprisingly, the Dutch corpus is the smallest (see footnote 5), whereas it contains the highest number of occurrences of the construction. Table 1 shows the normalized frequencies and indicates that the construction is indeed overall most productive in Dutch and least in French.

	nlTenTen14	enTenTen15	frTenTen17
<b>Corpus size (total number of words)</b>	2,253,777,579	13,190,556,334	5,752,261,039
<b>Number of occurrences of the CCC (after manual selection)</b>	272	245	78
<b>Normalized frequency (per million words)</b>	0.121	0.019	0.014

Table 1. Corpus size and frequencies of the CCC

For the remainder of the analysis, we randomly selected 150 concordance lines from the Dutch and English datasets, and kept the 78 occurrences of the French sample. The whole dataset was then coded for the formal and lexical-semantic parameters summarized in Table 2. In this paper, we focus on the results pertaining to the colour terms and the emotions, and therefore leave out the results for the verbs as lexical fillers, as well as the semantic type of the subject, indicated in italics in the table (see Poncin, 2021 for a comprehensive review).

We used the three semantic categories identified in Section 2.2 for the semantic analysis of the colour adjective (i.e., literal, metonymic and metaphorical). However, during the coding process, a fourth label named ‘literal/metonymic’ had to be introduced to account for cases in which it was difficult to determine whether the emphasis lied on the colour of the face (or another body part), or on the emotion itself. Cases concerning (the rise of) a specific bodily fluid that is not always literally visible (e.g., bile when turning *green with envy*) were

coded as purely ‘metonymic’ (De Knop, 2013, 2014). When the effect of the rising fluid (e.g., blood when turning *red with anger* or *shame*) or the emotional state (e.g., paleness when turning *white with fear*) was likely to become visible, the use of the colour term was coded as ‘literal/metonymic’ because the literal colour of (the face of) the subject then metonymically represents the experienced emotion.

Formal parameters	Lexical-semantic parameters	Productivity (TTR) → four conditions
Use of one or more colour term(s) per concordance line	Lexical fillers (lemma(ta) of the colour(s) and the emotion(s) + <i>lemma of the verb</i> )	Based on the colour-types
Use of one or more emotion noun(s) per concordance line	<i>Semantic type of the subject (animate – inanimate)</i>	Based on the emotion-types
Presence of degree modification	Use of the colour adjective (literal – literal/metonymic – metonymic – metaphoric)	Based on the combination of colours with specific emotions (which emotions combine with one and the same colour?)
Form of the colour adjective	Intensifying meaning or not	Based on the combination of emotions with specific colours (which colours combine with one and the same emotion?)

Table 2. Overview of the formal, lexical-semantic and productivity parameters

Finally, the data were analysed using Microsoft Excel and the type-token ratios (TTR) of all four conditions mentioned in Table 2 were calculated for each dataset. Additionally, the results were compared between languages to bring out any shared tendencies as well as striking differences.

## 4. Results

This section provides the results of the contrastive study. Section 4.1 focuses on the formal features, lexical-semantic variation and productivity of the CCC. Section 4.2 then deals with the language-specific preferences of the CCC in terms of colour-emotion associations. Lastly, Section 4.3 investigates the potential for intensification of the construction under study.

## 4.1. Formal features, lexical-semantic variation and productivity

The first aim of this study is to analyse the formal and lexical-semantic variation found for the CCC in Dutch, English and French, as well as its productivity rates.

### 4.1.1. Formal features

The first formal feature of interest is the number of colour terms per concordance line. Table 3 shows that the CCC can contain up to two colour terms in all three languages, but in most cases, it only includes one colour adjective. An interesting difference is that the English and French datasets only contain one combination each, whereas the Dutch dataset counts nine instances of colour combinations. However, only the difference between Dutch and English (not French) is statistically significant<sup>6</sup>. Among these nine combinations, *groen en geel* ('green and yellow') appears eight times (see (11)), whereas *wit en rood* ('white and red') appears only once.

	NL (n = 150)	EN (n = 150)	FR (n = 78)
<b>1 colour term</b>	94.0% (n = 141)	99.3% (n = 149)	98.7% (n = 77)
<b>2 colour terms</b>	6.0% (n = 9)	0.7% (n = 1)	1.3% (n = 1)

Table 3. Number of colour terms per concordance line in each dataset

The second feature involves the number of emotion nouns per concordance line. Table 4 indicates that, here too, the CCC can combine up to two emotion terms in all three languages (see (12a-b)), but mostly involves only one such a term. None of the three datasets features an occurrence that combines two colour terms with two emotion nouns.

- (11) Ze zagen **groen en geel van angst** [...]  
 'They looked green and yellow with fear [...]'
- (12) a. Le visage de Musaylima devint **rouge de colère et de confusion**.  
 'Musaylima's face turned red with anger and confusion.'  
 b. De president kleurde **rood van woede en ongeloof**.  
 'The president turned red with anger and disbelief.'

<sup>6</sup> The difference between Dutch and English:  $X^2(1, N = 300) = 6.62, p = .01008$ .

	NL (n = 150)	EN (n = 150)	FR (n = 78)
<b>1 emotion noun</b>	95.3% (n = 143)	94.0% (n = 141)	94.9% (n = 74)
<b>2 emotion nouns</b>	4.7% (n = 7)	6.0% (n = 9)	5.1% (n = 4)

Table 4. Number of emotion nouns per concordance line in each dataset

Although degree modification of the colour adjective is possible in all three languages (see Table 5), it does not occur often in our corpus. The French dataset only includes examples with the adverb *tout(e)*, as illustrated in (13a). Examples (13b–c) show degree modification with adverbs and noun phrases in the Dutch and English datasets. Furthermore, the English dataset shows that the colour adjective within the CCC can even be modified by a noun modifying its colour shade. This is of course common beyond the CCC (e.g., *lime green*, *midnight blue*), but we didn't expect such colour shades to be part of the CCC: in (14) *green* is compared to the actual colour of a pea, giving the impression that George is extremely jealous.

- (13) a. Charlotte est **toute rouge de honte**, de confusion  
Lit. 'Charlotte is all red with shame, with confusion'  
b. She was **very red with embarrassment**  
c. Hij werd **een beetje rood van schaamte**  
'He became a little bit red with shame.'
- (14) Their leader George is **pea green with envy**

	NL (n = 150)	EN (n = 150)	FR (n = 78)
<b>No degree modification</b>	85.3% (n = 128)	87.3% (n = 131)	93.6% (n = 73)
<b>Degree modification</b>	14.7% (n = 22)	12.7% (n = 19)	6.4% (n = 5)

Table 5. Percentages of degree modification in each dataset

As far as the form of the colour adjective is concerned, the majority of hits contains adjectives in the positive form, but the comparative form is also rarely attested. The sentence in (15) illustrates such a case.

- (15) His wide, ruddy face had turned even **redder with anger**

#### 4.1.2. Lexical-semantic features

In terms of the number of colour-types and emotion-types in each dataset, most variation is found in the emotion-slot in all three languages, as shown in Table 6. This is not a surprising finding since the corpus query was limited to Berlin and Kay's (1969) six primary basic colours and their possible combinations. With respect to the emotion-slot, Dutch and English yield

similar results, with 34 different emotion-types for Dutch and 33 for English, against only 14 for French. As indicated by the type-token ratios (TTR), the lower type frequencies found in the French dataset are not (only) due to the smaller size of the dataset.

	NL (n = 150)	EN (n = 150)	FR (n = 78)
<b>Colour-types</b>	9 (TTR = 0.06)	7 (TTR = 0.05)	6 (TTR = 0.08)
<b>Emotion-types</b>	34 (TTR = 0.23)	33 (TTR = 0.22)	14 (TTR = 0.18)

Table 6. Number of colour-types and emotion-types per dataset

The pie charts in Figures 2 to 4 reveal that all three languages share the same top three of colour terms: *red* is the most frequently used colour in the CCC, followed by *green* and *white*.

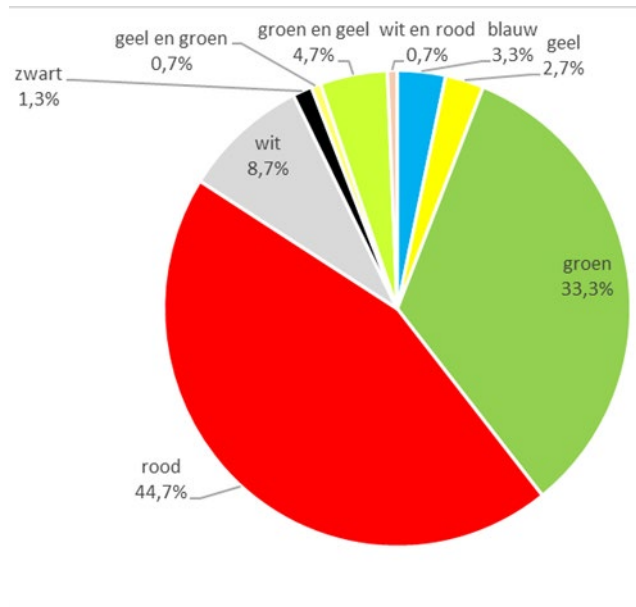


Figure 2. Percentage of each colour term in the Dutch data (nlTenTen14, n = 150)

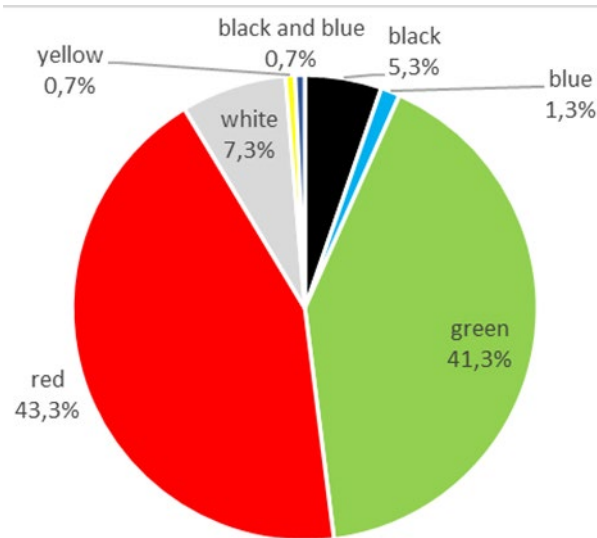


Figure 3. Percentage of each colour term in the English data (enTenTen15, n = 150)

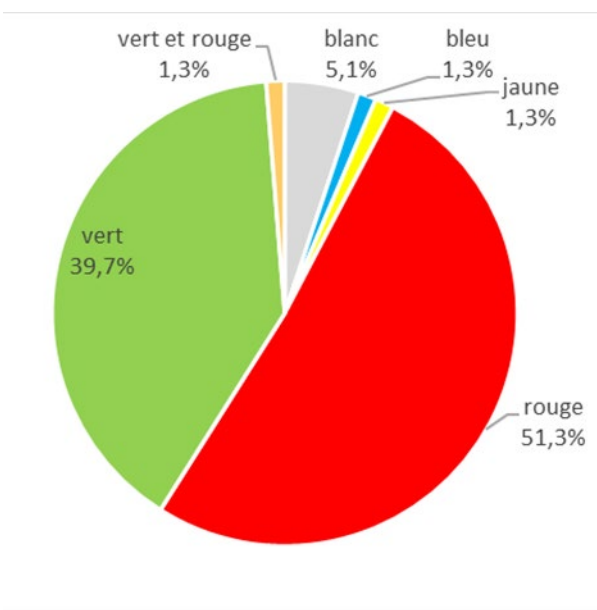


Figure 4. Percentage of each colour term in the French data (frTenTen17, n = 78)

Table 7 provides an overview of the semantic readings of the CCC in each dataset. Not all readings appear in equal measure across the dataset. On the one hand, sentences like (16), in which the colour must be understood literally, seem to be rather rare, and do not come up at all in the French data. The literal/metonymic interpretation, on the other hand, accounts for about half the instances of the CCC in the three languages under study. An example of this can be found in (17), where the literal colour of the face as well as the connection with blood can justify the use of *red* in association with *anger*. The second most frequent semantic use in all three languages is the (purely) metonymic interpretation; this is illustrated in sentence

(18) where *envy* is associated with bile, hence with the colour *green*. Lastly, the metaphoric reading is not very frequent in any of the investigated languages but does come up in the data, as attested by example (19).

- (16) Noses, fingers and toes are **red with cold**  
 (17) Reuben's face turns **red with anger**  
 (18) The Bloomberg correspondent was **green with envy**  
 (19) He turned **black with rage** by the news of his daughter's birth

	NL (n = 150)	EN (n = 150)	FR (n = 78)
<b>Literal</b>	3.3%	2.7%	-
<b>Literal/metonymic</b>	56.0%	50.7%	55.1%
<b>Metonymic</b>	39.3%	41.3%	42.3%
<b>Metaphoric</b>	1.3%	5.3%	2.6%

Table 7. Meaning of the CCC in each dataset

#### 4.1.3. Productivity

In terms of type-token ratios, the reported ratios in Table 6 already indicated that the emotion-slot is more productive than the colour-slot since we restricted the colour-slot to six basic colour terms. The highest TTR scores for the emotion-slot are found in Dutch (0.23) and English (0.22), whereas the TTR score for French is 0.18.

Creative uses of the CCC can be determined by looking at the number of hapaxes, i.e., types which only appear once in the dataset. Here too, the emotion slot leaves room for more variation than the colour slot. This can be observed in Table 8, which showcases the higher potential productivity, i.e., the division of the number of hapaxes by the number of tokens (Baayen, 2009), of the emotion slot compared to the colour slot in each language, but especially in Dutch and English. It is worth noting that, in all three languages, hapaxes in both slots include but are not limited to combinations of two types. By way of example, the constructions in (20) include hapaxes in the colour slot, the constructions in (21) contain hapaxes in the emotion slot, and the construction in (22) includes both a colour term and an emotion noun that only appear once in the dataset, thus representing a fully creative use of the CCC.

- (20) a. My face turned **black and blue with cold**  
 b. ik werd **wit en rood van opwinding**  
 ‘I became white and red with excitement’  
 c. la reine était devenue [...] toute **jaune de jalousie**  
 Lit. ‘the queen had become all yellow with jealousy’
- (21) a. my face went **white with terror**  
 b. Jennie was inmiddels helemaal **rood van verdriet**  
 ‘Jennie was now completely red with sadness’  
 c. Charlotte est toute **rouge de honte, de confusion**  
 Lit. ‘Charlotte is all red with shame, with confusion’
- (22) you grow **yellow with cowardice**

	Colour terms			Emotion nouns		
	NL (n = 150)	EN (n = 150)	FR (n = 78)	NL (n = 150)	EN (n = 150)	FR (n = 78)
<b>Hapax legomena</b>	2	2	3	20	21	7
<b>Tokens</b>	150	150	78	150	150	78
<b>Potential productivity</b>	0.01	0.01	0.04	0.13	0.14	0.09

Table 8. Potential productivity of the colour slot and the emotion slot in each language

#### 4.2. Language-specific preferences in terms of colour-emotion associations

The second aim of this study is to uncover language-specific preferences of colour-emotion associations used in the CCC.

A closer look at the productivity rates per colour term or per emotion term (in other words, per lexical filler) reveals a more precise picture compared to the general productivity rates of each slot. For instance, we see that *red* and *green* yield very different results despite being the two most frequently used colour terms in the CCC. *Red* is combined with a higher number of emotion-types in the three investigated languages than *green*. The difference in TTR score for *red* and *green* is most pronounced in English, as demonstrated by Tables 9 and 10.

Red	NL (n = 150)	EN (n = 150)	FR (n = 78)
Emotion nouns (Tokens)	67	65	40
Emotion nouns (Types)	19	17	10
TTR	0.28	0.26	0.25

Table 9. Type-token ratio (TTR) of emotion nouns combined with the colour term red in each dataset

Green	NL (n = 150)	EN (n = 150)	FR (n = 78)
Emotion nouns (Tokens)	50	62	31
Emotion nouns (Types)	11	5	5
TTR	0.22	0.08	0.16

Table 10. Type-token ratio (TTR) of emotion nouns combined with the colour term green in each dataset

However, such differences between languages are not necessarily due to cross-linguistic differences (alone). On the one hand, differences do exist in terms of the number of emotions which are associated with a specific colour term (and vice versa) in each language. That is the case for the colour *black*: *zwart* is used only twice in the Dutch dataset, each time with a different emotion (*geluk* ‘joy’ and *woede* ‘rage’), while English *black* comes up eight times with six different (combinations of) emotions (namely *shame*, *rage*, *indifference*, *malice*, *devotion*, and *passion and humour*). In the French dataset, however, *noir* does not appear at all. On the other hand, greater differences seem to exist in terms of language-specific preferences. Although some associations are shared across languages (e.g., *red with shame/rood van schaamte/rouge de rage*), some languages seem to favour one association over another. For instance, Table 11 shows that the emotion-noun *rage* is typically associated with the colour *vert* in French (*vert de rage*), as opposed to Dutch and English, which both favour the colour *red* in this semantic field (*rood van woede*, *red with rage*). In French, *red* is more typically associated with the emotion-noun *colère* ‘anger’ instead (*rouge de colère*), as is the case in English (*red with anger*) but there is only one instance of the equivalent combination in the Dutch dataset (*rood van boosheid*).

	NL <i>woede</i> 'rage'	NL <i>boosheid</i> 'anger'	EN <i>rage</i>	EN <i>anger</i>	FR <i>rage</i>	FR <i>colère</i> 'anger'
<b>Black</b>	1	/	3	/	/	/
<b>Green</b>	2	/	/	/	19 (82.6%)	2
<b>Red</b>	13 (59.1%)	1	10 (71.4%)	16 (94.1%)	1	11 (78.6%)
<b>White</b>	5	/	1	1	2	1
<b>Yellow</b>	1	/	/	/	/	/
<b>Green and red</b>	/	/	/	/	1	/
<b>Total number of tokens</b>	<b>22</b>	<b>1</b>	<b>14</b>	<b>17</b>	<b>23</b>	<b>14</b>

Table 11. Absolute and relative frequencies of colour terms associated to the emotion 'anger/rage' in each dataset

Table 12 shows the top five of the most frequent combinations in each language. A number of shared instances across languages (e.g., *groen van jaloezie*, *green with envy*, *vert de jalousie* and *rood van schaamte*, *red with embarrassment/shame*, *rouge de honte*) are highlighted, although they occur with quite different frequencies. The table also indicates some interesting cross-linguistic differences in the most frequent combinations (e.g., *vert de rage* in French, but *groen van jaloezie* and *green with envy* in Dutch and English respectively)

	NL (n = 150)	EN (n = 150)	FR (n = 78)
<b>1</b>	<i>Groen van jaloezie</i> (n = 32, 21.3%)	<i>Green with envy</i> (n = 56, 37.3%)	<i>Vert de rage</i> (n = 19, 24.4%)
<b>2</b>	<i>Rood van schaamte</i> (n = 23, 15.3%)	<i>Red with embarrassment</i> (n = 17, 11.3%)	<i>Rouge de honte</i> (n = 16, 20.5%)
<b>3</b>	<i>Rood van woede</i> (n = 13, 8.7%)	<i>Red with anger</i> (n = 16, 10.7%)	<i>Rouge de colère</i> (n = 11, 14.1%)
<b>4</b>	<i>Rood van opwinding</i> (n = 9, 6.0%)	<i>Red with rage</i> (n = 10, 6.7%)	<i>Vert de jalousie</i> (n = 7, 9%)
<b>5</b>	<i>Groen van ellende</i> (n = 7, 4.7%)	<i>Red with shame</i> (n = 5, 3.3%)	<i>Rouge de confusion</i> (n = 5, 6.4%)

Table 12. Top five colour-emotion combinations within the CCC in each language

### 4.3. Potential for intensification

The third aim of this study is to investigate the extent to which the CCC has potential for intensification. Overall, most instances of the CCC in the datasets can be regarded as intensifying expressions (see Table 13). A simple way to test this intensifying meaning of the CCC is by replacing the construction with the structure ‘subject + *is/turns* + *very* + adjective related to the emotion’. For example, because the meaning of sentence (23b) is very close to that of sentence (23a), it can be concluded that the example in (23a) is used to express intensification of the emotional state. In contrast, in example (24) the subject itself does not undergo any extreme emotion. In this sentence, the literal colour of a personified subject (the apples) is associated with an emotion (the pleasure one might feel when eating one of these apples).

- (23) a. hij wordt **groen van jaloezie**  
       ‘he becomes green with jealousy’  
       b. hij wordt **heel jaloers**  
       ‘he becomes very jealous’
- (24) de appels zien **rood van plezier**  
       Lit. ‘the apples are red with pleasure’

	NL (n = 150)	EN (n = 150)	FR (n = 78)
<b>Intensification</b>	92.0% (n = 138)	97.3% (n = 146)	100.0% (n = 78)
<b>Other meaning</b>	8.0% (n = 12)	2.7% (n = 4)	-

Table 2. Holistic meaning of the CCC in each dataset

In the French dataset, all examples express an intensifying meaning; in the Dutch dataset we find 8.0% of examples without such an intensifying interpretation.

## 5. Summary of the results and discussion

The aim of this contrastive study was to describe the different constructional aspects of the CCC. In terms of syntactic variation, the results show that the CCC generally follows the pattern [NP<sub>subject</sub> V [Adj<sub>colour</sub> Prep<sub>causal</sub> N<sub>emotion</sub>]] in all three investigated languages. Nevertheless, it sometimes allows the combination of two colour terms or two emotion nouns within one and the same occurrence in the three investigated languages, as well as some degree modification of the colour adjective. The prepositional slot is fixed in French (*de*) and Dutch (*van*), and was restricted to the most frequent preposition (*with*) in English. The empty slots

in this semi-schematic construction, which can be completed by different lexical fillers, cause a certain degree of lexical variation. The colour terms analysed in this study all belong to Berlin and Kay's (1969) six primary BCTs, of which *red*, *green*, and *white* are used most often in our corpus. Semantically speaking, these colour terms in most cases lead to literal/metonymical or properly metonymical readings of the construction.

In terms of general productivity, the emotion-slot was shown to be more productive than the colour-slot, which is obviously due to the limited number of colours originally included in the query. Even though other colour terms were not considered in this study, it does not mean that other colours are excluded in the CCC. We already noticed that colour shades such as *pea green* occur in the data. A quick search in the Dutch TenTen corpus (nlTenTen14) on SketchEngine, using a revised version of the CQL query, yields, for instance, hits such as *Lune was nu paars van woede* 'Lune was now purple with rage'. Therefore, further investigation of all the colour terms across the corpora is required to be able to generalise the claim that the colour slot is less productive than the emotion slot. Furthermore, a great number of colour-emotion associations are shared across the three languages, although cross-linguistic differences arise due to preferences of specific associations over others. An analysis of the use of each colour term individually, for instance, reveals that *red* and *green* behave quite differently in the CCC despite being the two most frequently used colours in all three languages, as *red* is combined with a higher number of different emotion-types than *green*.

Another way to analyse the productivity of the CCC is by applying Barðdal's (2008) theory of productivity and semantic coherence. Barðdal argues that there is an inverse correlation between the type frequency and the semantic coherence of a construction. We can apply this to the comparison of *red* and *green* as lexical fillers. In the English dataset, the CCC filled with the colour term *red* has a relatively high type frequency, in the sense that it combines with 17 different emotion-types. Although this colour is often associated with negative emotions (e.g., *anger*, *embarrassment*, *rage*), it may also co-occur with positive ones (e.g., *excitement*, *surprise*). This can also be seen in the Dutch and French data, where negative emotions (e.g., *woede/rage* 'anger', *schaamte/honte* 'shame') as well as positive emotions (e.g., *plezier/plaisir* 'pleasure') occur with *rood* and *rouge*. By contrast, when filled with the colour term *green*, the construction has a low type frequency, only combining with five different emotion-types in the English dataset. Among these five emotion-types, *envy* is used most frequently (90.3%, n = 56), while the other types hardly occur at all: *jealousy* is found three times, while *fright*, *dismay*, and *envy and shock* all appear only once. These are all negative emotions. Furthermore, three of these five types (*envy*, *jealousy*, and *envy and shock*) belong to the semantic domain of jealousy. This

implies that the constructions with *red* show a high degree of productivity but a low degree of semantic coherence, i.e., the colour does not impose important restrictions on the emotion-type it combines with. The constructions with *green*, by contrast, display low type frequency but are semantically more coherent, since they almost exclusively combine with emotions from the ‘envy/jealousy’ domain.

If we attempt to position colour-emotion associations on a cline considering their type frequency and their semantic cohesion, the English colour term *white* would be placed between *red* and *green* since almost all of its nine emotion-types it combines with (*anger, fear, pain, rage, shock, surprise, terror, astonishment and indignation, shock and disgust*) refer to negative emotions but cannot easily be assigned to a particular semantic domain. Nevertheless, the positions of the colour terms on the cline seem to depend on the language; in Dutch, for instance, *groen* combines with almost twice as many emotion-types (11) as *wit* (6) and would have to be positioned higher on the productivity axis. A further, extreme example that applies to both Dutch and English is that of the construction filled with the colour term *blue* (*blauw*), which is considered completely unproductive and fully semantically coherent because of the single type it combines with, namely *cold* (*kou*). Therefore, the combinations *blue with cold* and *blauw van de kou* are located on the extreme end of the cline. To visualise these findings, the relevant English colour terms are placed on the cline in Figure 6.

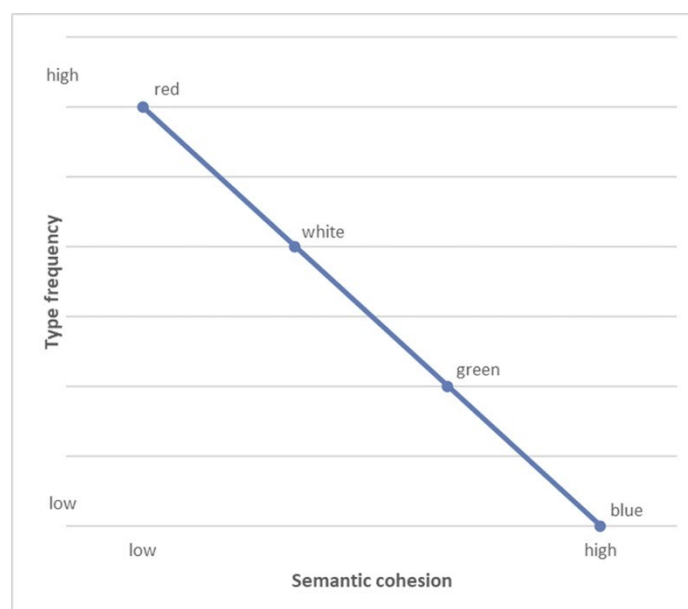


Figure 5. Schematic representation of English colour terms on Barðdal's (2008) productivity cline

Finally, this study confirms that the CCC is mostly used to express an extreme emotion or emotional state, an aspect of meaning only briefly discussed in previous research (De Knop, 2013, 2014). Our analysis of the holistic meaning of the CCC further shows that CCCs based

on recurring colour-emotion associations (e.g., *red with shame*, *rood van woede* ‘red with rage’, *vert de rage* ‘green with rage’; see Table 12) are likely to be stored as such, and could therefore be considered lexicalized intensifying collocations because they comply with Grandi’s (2017b) criteria to identify such intensifying constructions (see Section 2.3): apart from expressing extreme emotions, the instantiations of the CCC mostly show a low degree of semantic compositionality and a high degree of internal cohesion. Note that this applies to the recurring instantiations of the CCC (e.g., *red with shame*) and not to its general pattern where only the causal preposition is fixed. More creative uses of the CCC can therefore be regarded as partially lexicalized intensifying constructions, since the preposition does not vary (except for English) and the colour-emotion associations they are based on are always motivated, either literally, metonymically, or metaphorically.

## 6. Conclusion

This study aimed to provide a comprehensive contrastive description of the Colourful Causal Construction in Dutch, English and French by analysing its main formal and lexical-semantic features, as well as its productivity. Previous research had, to our knowledge, not provided researchers with such a broad (though by no means exhaustive) constructional account of the CCC, especially not for Dutch. We further intended to shed light on the nature of the colour-emotion associations underlying the CCC and on the intensifying potential of this construction.

The study was conducted through a corpus investigation of the Dutch, English and French versions of the TenTen web corpora, which contain recent authentic material retrieved from the Internet. Results show that the CCC fits a similar semi-schematic pattern in the three languages under study, while still allowing for the combination of up to two colour terms and/or emotion nouns used in the occurrence. All three languages share the same top three of lexical fillers in the colour slot, namely *red*, *green* and *white*. These constructions must be understood semantically in a literal/metonymic way in approximately 50% of the cases across the three investigated languages. In terms of productivity, the constructions filled with specific colour terms can be placed on a cline according to their type frequency and semantic cohesion (as inversely related parameters), as some colours correlate with high type frequency of the emotion nouns they combine with and few semantic restrictions, or vice versa. The data also shows that some colour-emotion associations are shared and used with similar frequencies in all three languages (e.g., *rood van schaamte*, *red with embarrassment*, *rouge de honte*), but striking language-specific preferences also exist (e.g., *red with rage*, *rood van woede* vs. *vert de*

rage). Finally, we argued that the CCC can be considered as a (partially) lexicalized intensifying construction which can be creatively used to express an extreme (change in) emotion.

Future research on the CCC should pay attention to a few limitations of the current analysis. Firstly, the CQL queries could possibly be refined to extract more accurately occurrences of interest. Because the queries used in this study were quite broad, a great number of the extracted hits did not meet the criteria of the CCC and therefore had to be excluded. This led to small, uneven final samples and few statistically robust results. In addition, future studies should also include the Berlin and Kay's (1969) five secondary BCTs, i.e., *brown*, *purple*, *pink*, *orange*, and *grey*, to test the hypothesis put forward by other researchers that these colours appear less often in the CCC (De Knop, 2013, 2014) and to verify their potential for (language-specific) intensification.

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