

Demonstratives, Frames of Reference, and Semantic Universals of Space

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Abstract

There is a large body of research indicating that speakers of (familiar) European languages tend to encode and conceptualize space from an egocentric perspective, but linguistic fieldworkers have shown that speakers of certain other languages (e.g. Tzeltal) often describe the same spatial scenes based on fixed coordinates of the environment. This has led some researcher to challenge long-standing assumptions about semantic universals of space and the uniformity of spatial cognition. Specifically, Levinson and colleagues have questioned the hypothesis that there is a universal preference for egocentric, body-oriented representations of space in language and cognition. It is the purpose of the present paper to reconsider this hypothesis in light of an important class of spatial terms that has been disregarded in this research: demonstratives such as English *this* and *that* and *here* and *there*. The paper shows that the semantic interpretation of demonstratives presupposes a coordinate system with the same conceptual constituents as body-based expressions such as *left* and *right* or *up* and *down*. Combining evidence from linguistic typology with psychological research on joint attention, it is argued that demonstratives constitute a universal class of spatial terms that invoke an egocentric, body-anchored frame of reference grounded in basic principles of spatial and social cognition.

1. Introduction

Languages differ in the way they describe space, but there is one aspect of spatial language [Q1](#) that linguists, psychologists, and philosophers have always considered universal: the tendency to encode and conceptualize space from of an egocentric, body-oriented perspective (cf. Carlson-Radvansky and Irwin 1993, 1994; Clark 1973; Lyons 1977; Miller and Johnson-Laird 1976). Consider for instance the following quote from Miller and Johnson-Laird (1976), who emphasized the importance of our bodily experience, especially during childhood, for the predominance of egocentric representations of space:

The conceptual core of space probably originates, as Cassirer (1923) and others have maintained, with the body concept – with what is at, in, or on our own bodies. The first spatial relatum we learn to use is ego. ... Piaget and Inhelder (1948) claim that escape from this egocentric space requires considerable cognitive development. ... The ability to decenter does not displace the egocentric conception of space, but supplements it. ... Egocentric use of space concept places ego at the center of the universe. From this point of origin ego can lay out a three-dimensional co-ordinate system that depends on his own orientation.

(Miller and Johnson-Laird 1976: 394–5)

This view of spatial cognition has been challenged in a series of cross-linguistic studies by Levinson and colleagues who found some unexpected differences in the way languages represent space (cf. Brown and Levinson 1993; Levinson 1996, 2003; Levinson et al. 2002; [Q2](#) Levinson and Wilkins 2006; Pederson et al. 1998). In particular, they found that while

speakers of English usually describe spatial relations from an egocentric, body-oriented perspective, speakers of other languages make common use of an absolute frame of reference involving fixed coordinates based on geographical landmarks (e.g. *uphill*, *downhill*) or cardinal directions of the environment (e.g. *north*, *south*) (see also Haviland 1993).

Intrigued by this finding, Levinson and colleagues conducted a series of experiments that were designed to investigate the influence of linguistic frames of reference on nonverbal spatial cognition. The results of this research suggest that language-specific preferences for a particular linguistic frame of reference can have a marked impact on spatial memory and reasoning. For instance, Pederson et al. (1998) have found some conspicuous differences in the way rotations in space are interpreted by speakers of Dutch, in which spatial descriptions usually involve a relative, egocentric frame of reference, and speakers of Tzeltal, in which the absolute frame of reference is very common (but see Li et al. 2011).

These findings have led Levinson and colleagues to propose a new typology of frames of reference and to challenge some long-standing assumptions about semantic universals of space. Specifically, they make the two following claims:

- (1) First, they contend that the egocentric, body-oriented coordinate system is not generally the most important frame of reference as commonly assumed: 'It is not only that there are languages that do not use the bodily coordinates to construct a relative frame of reference, but there are also many other aspects of such languages, and of the interaction and cognition of their speakers, that point to a fundamental demoting of the body as a source of spatial concepts'. (Levinson 2003: 14)
- (2) And second, they argue, more generally, against the existence of semantic universals of space in both language and cognition: 'Semantic parameters [of space] are not universal, that is not shared by all languages'. 'The overall picture that emerges is that our species is not cognitively uniform ...'. (cf. Levinson 2003: 303, 22).

In this paper, I will take issue with these hypotheses, arguing that while the studies of Levinson and colleagues revealed some important cross-linguistic differences in the encoding and conceptualization of space, the two above hypotheses are problematic because they disregard the most important class of spatial expressions involving a frame of reference: demonstratives such as English *this* and *that* and *here* and *there*. The current paper argues that the semantic interpretation of demonstratives presupposes a coordinate system with the same conceptual constituents as the expressions Levinson and colleagues investigated in their research; but the cross-linguistic analysis of demonstratives is not consistent with their hypotheses about language diversity and semantic universals of space.

Combining evidence from cross-linguistic research on spatial deixis and psychological research on joint attention, the paper argues that demonstratives constitute a universal class of expressions that are of fundamental significance for communication, language, and cognition. In face-to-face conversations, demonstratives serve to establish a joint focus of attention providing a general foundation for spatial language and cognition. The proposed analysis provides evidence for the universal predominance of egocentric, body-oriented representations of space and endorses the traditional classification of frames of reference.

2. *The Cross-linguistic Classification of Frames of Reference*

There are many different ways of indicating locations and directions in language (e.g. Talmy 2000). Of particular interest are spatial expressions whose interpretation involves a coordinate system, commonly referred to as a frame of reference. These coordinate systems have been at center stage in current linguistic and psycholinguistic research on spatial language and

cognition (e.g. Danziger 2010; Levinson 1996, 2003; Levinson et al. 2002; Pederson et al. 1998; Majid et al. 2004; Mishra et al. 2003; Li and Gleitman 2002; Burenhult 2008; Li et al. 2011; Tenbrink and Kuhn 2011; Polian and Bohnemeyer 2011; Janzen et al. 2012).

Spatial expressions that are interpreted in the context of a frame of reference generally involve a perspective or viewpoint and usually allow for mental mappings or transpositions providing insights into the principles of spatial cognition. However, the notion of frame of reference is not used consistently in the literature. In this paper, I adopt the definition of Levinson (1996, 2003) and colleagues, who have characterized a frame of reference as a coordinate system involving (at least) the following conceptual constituents:

- (1) The *figure*, which is the entity that the speaker seeks to locate in the coordinate system.
- (2) The *ground*, which is the entity with regard to which the figure is located.
- (3) The *origin*, which is the center of the frame of reference, i.e. the point where the axes of the underlying coordinate system meet.
- (4) The *viewer*, which provides a perspective from which the whole scene is seen.
- (5) And the *angular specification*, which indicate an angle or direction between figure and ground (or figure, ground, and anchor/viewer).

For instance, in the sentence *The car stopped in front of the bus*, ‘the car’ is the figure and ‘the bus’ is the ground, the origin is embedded in the ground, the viewer is the speaker (or some other person not mentioned in the sentence), and the angular specifications are provided by the expression *in front of* in conjunction with figure and ground. In addition to these terms, some studies use the notion of a ‘conceptual anchor’ to characterize a frame of reference (e.g. Danziger 2010): ‘The Anchor is the zero point from which the vector is calculated that narrows the search space from Ground and Figure’ (Danziger 2010: 168). However, since this is basically identical with the zero point that constitutes the origin of a frame of reference, the terms ‘anchor’ and ‘origin’ are interchangeable in most contexts.

Traditionally, three types of frames are distinguished based on the type of origin (or anchor): (i) a viewer-centered (or egocentric) frame of reference, in which the origin/anchor is determined by the speaker’s (or some other person’s) bodily coordinates at the time of the utterance; (ii) an object-centered frame of reference, in which the anchor is embedded in a ground object with an inherent orientation (e.g. a vehicle); and (iii) an environment-centered frame of reference, in which the origin/anchor is provided by fixed coordinates on the ground that are usually based on geographical landmarks or cardinal directions (cf. Carlson-Radvansky and Irwin 1993). The sentences in (1) to (3) provide an example of each type:

- | | |
|--|----------------------|
| (1) The ball is to the left of the tree. | viewer-centered |
| (2) The car stopped in front of the bus. | object-centered |
| (3) The town is in the south of Germany. | environment-centered |

The terms viewer-centered, object-centered, and environment-centered are primarily used in the psychological literature. In the linguistic literature, the same three types of frames are usually referred to by the notions of deictic frame, intrinsic frame, and extrinsic frame (cf. Fillmore 1997; Lyons 1977).

Levinson (1996, 2003) proposed a different typology of frames of reference, which also involves three different systems, i.e. the relative frame of reference, the intrinsic frame of reference, and the absolute frame of reference. However, this typology is based on different criteria: It highlights the importance of the ‘logical structure’ of the coordinate system (Levinson 2003: 50) and demotes the role of the ‘nature of the origin/anchor’ for the analysis of spatial coordinate systems. The logical structure of a frame of reference is defined by (i) the

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number of elements (i.e. arguments) involved in a spatial array and (ii) the properties of the array under rotation.

Specifically, Levinson argues that the relative frame of reference is distinguished from the intrinsic frame of reference and the absolute frame of reference in that the relative frame of reference involves a ternary relation between figure, ground, and viewer, whereas the two other frames involve only a binary relation between figure and ground. This analysis rests on the assumption that there is no viewer or that the viewer is irrelevant in the intrinsic and absolute frames of reference, which is somewhat problematic given that Levinson takes the viewer into account when analyzing the properties of the three frames under rotation (see below). There is, however, a related difference between the relative frame of reference and the two other frames when we consider the relation between figure, ground, and origin/anchor (cf. Danziger 2010). As it turns out, in the intrinsic frame of reference and in the absolute frame of reference, ground and origin/anchor are represented by the same entity: in the intrinsic frame of reference the origin/anchor is directly embedded in the ground object, and in the absolute frame of reference, the origin/anchor is placed on the region that constitutes the ground. By contrast, the relative frame of reference is determined by the viewer (usually the speaker) resulting in a ternary relation that is distinguished from the binary relation between figure and origin/anchor/ground in the two other frames of reference (cf. Figure 1).

Moreover, Levinson argues that the three frames have different properties under rotation. Of particular importance are the rotational properties of the intrinsic frame of reference and the absolute frame of reference. The intrinsic frame of reference describes a spatial array that remains constant when the position of the viewer is rotated but needs to be differently construed when only the ground is rotated. In contrast, the absolute frame of reference describes a spatial array that remains constant under both conditions. The third type of frame, i.e. the relative frame of reference, describes a spatial array that needs to be re-conceptualized when the position of the viewer is rotated but remains constant when the ground is rotated. Table 1 is based on Table 4.3 in Levinson (1996: 150) summarizing the previous discussion (see also Table 2.3. in Levinson 2003: 53).

All of the features in Table 1 are in principle compatible with the traditional origin/anchor-based typology of frames of reference; however, Levinson (1996: 135–8) questions the importance of the origin/anchor for the classification of coordinate systems because the linguistic expressions that underlie the traditional distinction between egocentric and allocentric (or deictic and non-deictic) frames of reference cuts across the three spatial

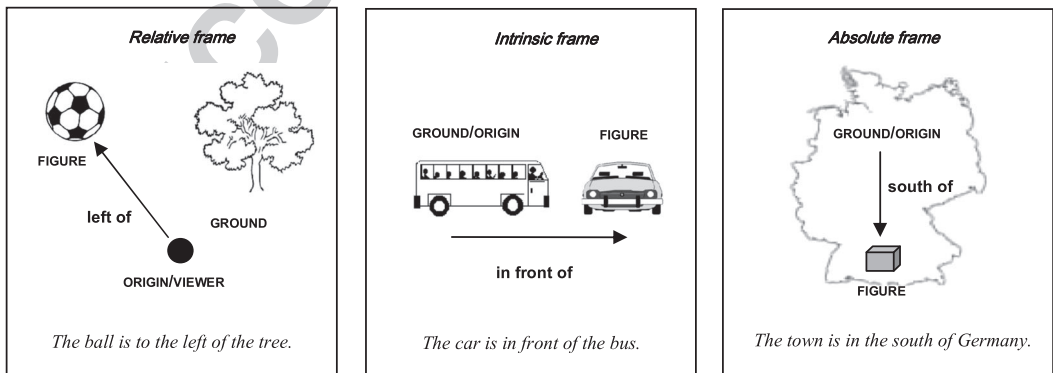


Fig 1. Figure, ground, anchor, and viewer in the relative frame, intrinsic frame, and absolute frame.

Table 1. Properties of different frames of reference (based on Levinson 1996: 150).

Relations Anchor	Intrinsic frame	Absolute frame	Relative frame
	Binary embedded in ground	Binary placed on ground	Ternary embedded in viewer
Constant under rotation of			
Ground	No	Yes	Yes
Viewer	Yes	Yes	No

coordinate systems that he distinguishes based on their logical structure. As can be seen in examples (4) to (9), all three frames of reference may or may not include a deictic origin/anchor, suggesting that the notion of deixis is irrelevant for the classification of spatial coordinate systems (examples adopted from Levinson 1996/2003: 50).

- (4) The ball is in front of the tree. (from the speaker’s perspective) (relative + deictic)
- (5) For John, the ball is in front of the tree. (relative + non-deictic)
- (6) The ball is in front of me. (intrinsic + deictic)
- (7) The ball is in front of the chair. (intrinsic + non-deictic)
- (8) The ball is north of me. (absolute + deictic)
- (9) The ball is north of the chair. (absolute + non-deictic)

Based on this analysis, Levinson concludes:

The phrase ‘deictic frame of reference’ is therefore, despite its prevalence, conceptual nonsense. Specifications of the origin of the coordinate system within a frame of reference is one way in which deixis contributes to spatial descriptions of all types.

(Levinson 2003: 71)

Levinson’s classification of frames of reference provides the theoretical foundation for a large body of cross-linguistic research on language and cognition (e.g. Danziger 2010; Levinson et al. 2002; Pederson et al. 1998; Majid et al. 2004; Mishra et al. 2003; Burenhult 2008; Polian and Bohnemeyer 2011). However, in what follows, I argue that while this approach has sharpened our view of spatial coordinate systems, the new typology of frames of reference is inappropriate for the analysis of the relationship between spatial language and cognition because it disregards the coordinate system of a very frequent class of spatial expressions, i.e. demonstratives, which is crucially defined by the nature of the conceptual origin/anchor.

3. Demonstratives and the Analysis of Frames of Reference

The bulk of current research on linguistic frames of reference is concerned with expressions that correspond to English *left* and *right* and, less frequently, *in front of* and *behind*, indicating locations and directions at the horizontal plane. Expressions indicating orientation in the vertical dimension (e.g. *up*, *down*) are usually disregarded because ‘intrinsic tops, relative viewpoints, and gravitational fields normally align’ so that we would not recognize any differences between the three types of frames (Levinson 2003: 75). Moreover, this research disregards other spatial expressions, e.g. nouns denoting places (e.g. *Berlin*, *Black Forest*), adverbs, particles and adpositions expressing topological notions of contact, adhesion and

containment (e.g. *in, on, at*), verbs and particles indicating motion (e.g. *come, go, move away*), and deictic specifications (e.g. *here, there, this, that*) (cf. Lyons 1977; Svorou 1994; Talmy 2000).

According to Levinson and colleagues, all of these expressions are irrelevant for the analysis of frames of reference because they do not involve a spatial coordinate system. The whole theory of frames of references is thus based on a few, relatively infrequent terms, notably *left* and *right*, and some geographical expressions (e.g. *north, south*) that speakers of languages like Tzeltal and Guugu Yimithirr employ in situations in which English speakers would use *left* and *right*.

Challenging this approach, I will now argue that the most important class of spatial expressions involving a frame of reference has been disregarded in this research. Like relational expressions such as *left* and *right*, demonstratives can only be interpreted in the context of a coordinate system involving the same conceptual constituents as the systems of spatial expressions Levinson and colleagues examined in their research; however, in the case of demonstratives, the coordinate system is defined by the nature of the origin/anchor.

Demonstratives comprise expressions such as English *this* and *that* and *here* and *there*. From a syntactic perspective, *this* and *that* can be seen as pronouns and *here* and *there* as adverbs; but since many languages employ the same roots or even the same word forms for demonstrative pronouns and spatial adverbs (cf. Diessel 1999a, 1999b, 2005, 2006; see also Fillmore 1997 and Krasnoukhova 2012: chap 9), I treat them as members of one class, to which I refer as demonstratives (or spatial deictics).

The members of this class can serve various syntactic functions. In many languages, demonstratives are used as pronouns, determiners, and adverbs; but there are also languages in which (some) demonstratives are used as verbs (cf. Dixon 2003) or particles (cf. Diessel 1999: chap 4). In fact, historical linguists have often argued that genuine demonstratives are particles that have acquired particular syntactic functions in the course of language change or language evolution (cf. Brugmann and Delbrück 1911: 311; Bühler 1934: 144). However, this hypothesis is impossible to verify by concrete historical data. What we can observe in the historical records is that the syntactic functions of demonstratives are subject to change. Demonstrative adverbs, for instance, are frequently reanalyzed as determiners, which in turn may be combined with classifiers or generic nouns to form a novel pronoun, which may then be combined with a locational case marker or adposition to form an adverb, suggesting the syntactic functions of demonstratives are very versatile (cf. Diessel 1999a: chap 2 and 4).

Semantically, demonstratives are usually characterized as deictics, but the notion of deixis is vague and has been applied to a wide range of expressions, which often have very little in common (e.g. personal pronouns, spatial and temporal adverbs/particles, tense affixes and auxiliaries, motion verbs, interjections, vocatives, etc.; cf. Diessel 2012a). In contrast to the term deixis, the notion of demonstrative is readily defined: It refers to a class of referential expressions that speakers use to focus the addressee's attention on a specific referent (or location) in the surrounding situation (or context) and that exhibit some universal semantic and pragmatic properties, as we will see.

Like other spatial expressions, demonstratives specify a relationship between a figure and ground; but they do this in a completely different way from relational expressions such as *left* and *right* or *in front of* and *behind*. The expressions Levinson and colleagues investigated in their research describe spatial relations between a lexical figure and a lexical ground, whereas demonstratives are used to focus the interlocutors' attention on referents or locations in the surrounding speech situation by way of pointing. Consider, for instance, the sentences in (10) and (11).

(10) The ball is in front of the car.

(11) The ball is (over) there.

The two sentences could be used with reference to the same spatial scene, but they orientate the speech participants in very different ways. Sentence (10) is semantically ambiguous.

It may denote a binary relation between figure and ground based on an intrinsic frame of reference anchored by the noun 'car'; or it may denote a ternary relation between figure, ground, and viewer based on a relative frame of reference anchored by the speaker. In the latter case, the sentence invokes a deictic interpretation in the sense that it involves the speaker's body as origin/anchor of the coordinate system. However, as we have seen in Section 2, the relative frame of reference does not generally involve a deictic origin/anchor. If the viewer is explicitly encoded in the sentence (cf. *For John the ball is in front of the tree*), it receives a non-deictic interpretation, indicating that even in the relative frame of reference, relational expressions such as *in front of* are not generally deictic.

This distinguishes these expressions from demonstratives such as *this* and *that* and *here* and *there*, which are always deictic (in the above mentioned sense). Sentence (11) denotes a binary relation between a lexically encoded figure and the deictic center also called the 'origo' (Bühler 1934).¹ In face-to-face conversations, demonstratives are interpreted based on the speaker's body, which also represents the viewer, origin, and ground. Of course, the deictic center can be transposed from the speaker to the addressee or some other person (cf. Bühler 1934), or it can occur inside of discourse creating a 'text internal origo' (Lyons 1977). In fact, some languages have particular morphological means to indicate deictic transpositions (or 'deictic projections'; Lyons 1977: 579). In Inuktitut, for instance, demonstratives can be combined with a particular prefix in order to signal that the deictic center has been shifted from the speaker to some other person in the surrounding situation (cf. *pik-unga* 'up there from the speaker's perspective' vs. *ta-ik-ung* 'up there from your/his/her/their perspective(s)'; Denny 1982: 362). However, if we disregard such deictic transpositions, the origin/anchor and ground are generally determined by the speaker's body at the time of the utterance, which can be seen as a conventionalized aspect of their meaning. Note that if we combine a demonstrative with a relational term such as *in front of* (e.g. *The ball is in front of that one*), the coordinate system is still anchored by the speaker's body, i.e. the frame of reference remains deictic (see below).

Traditionally, the semantic analysis of demonstratives has been primarily concerned with the indication of distance between the deictic center and the intended referent (e.g. Anderson and Keenan 1985). In English, for instance, demonstratives may be used to indicate a spatial contrast between a referent near the deictic center (referred to be *here* or *this*) and a referent outside of the domain conceptualized as the deictic center (referred to be *there* or *that*). This approach has been criticized, however, in a number of studies arguing that demonstratives are primarily used to coordinate the communicative interaction between the speech participants, rather than to indicate distance (e.g. Hanks 1990, 1992; Strauss 2002). Q6

As pointed out above, in face-to-face conversation, demonstratives are commonly used to manipulate the interlocutors' joint focus of attention, which does not always involve the indication of distance. In fact, demonstratives do not generally encode distance specifications. The Turkish demonstrative *şu*, for instance, is neutral with regard to distance. In the literature on Turkish demonstratives, it is commonly assumed that *şu* functions as the medial term of a three-way deictic system consisting of proximal *bu*, medial (or hearer-based) *şu*, and distal *o* (e.g. Kornfilt 1997; Lyons 1977); however, as Özyürek (1998) has shown, *şu* does not indicate a particular distance between referent and origo but functions to focus the hearer's attention on a new entity in the surrounding situation, i.e. an entity that was not yet in the interlocutors' joint focus of attention (see Küntay and Özyürek 2002). In contrast to *şu*, *bu* and *o* are used to continue a previously established focus of attention and they 'do' indicate distance: If *bu* and *o* are used contrastively, *bu* marks the referent that occurs in closer distance to the deictic center compared to the referent marked by *o*. Turkish has thus a three-way system defined by two features, namely, (i) joint attention and (ii) distance (cf. Figure 2).

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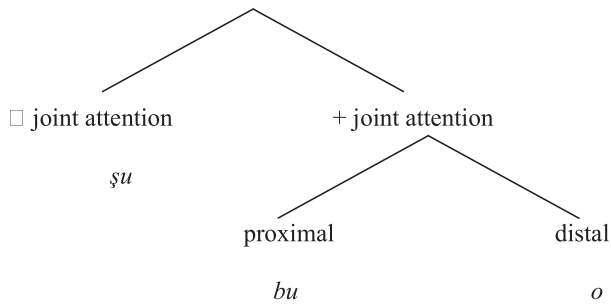


Fig 2. Features of Turkish demonstrative (adopted from Küntay and Özyürek 2002: 338).

In accordance with Özyürek's analysis of Turkish demonstratives, a number of recent studies have emphasized the importance of joint attention for the analysis of demonstratives (cf. Burenhult 2003; Diessel 2006). That does not mean, however, that spatial specifications are irrelevant for the semantic analysis of demonstratives. On the contrary, there is evidence from linguistic typology that the distance specifications of demonstratives are universals. As pointed out in Diessel (1999a), while demonstratives do not generally encode distance specifications, all languages seem to have at least two demonstratives that can be used to differentiate between referents or locations in different distance to the deictic center.

The vast majority of the world's languages has either two or three distance terms. Languages with three (or more) demonstratives are commonly divided into two basic types (cf. Anderson and Keenan 1985): Languages like Irish that differentiate between three different locations on a relative distance scale (*seo* 'proximal', *sin* 'medial', *siúd* 'distal') and languages like Japanese in which demonstratives differentiate between referents and locations near the speaker (*kore/kono/koko*), near the hearer (*sore/sono/soko*), and away from both speaker and hearer (*are/ano/asoko*). Languages with four (or more) deictic terms are relatively rare (cf. Diessel 2005; Gemer 2009). If they do occur, they usually involve the hearer as a particular point of reference. Abui, for instance, has hearer-based demonstratives that indicate a contrast between two referents in different distances to the addressee (cf. Kratochvíl 2011). Thus, although demonstratives are not generally used to indicate distance, they provide spatial orientation and often mark a contrast between referents in different distances to the deictic center.

However, in contrast to relational expressions such as *left* and *right*, demonstratives do not provide directional information, i.e. they lack 'angular specifications'. This is why Levinson and colleagues decided to exclude demonstratives from the analysis of frames of reference (cf. Levinson 2003: 69–71). But this decision is difficult to justify if we consider the semantic interpretation of demonstratives in face-to-face conversations.

Like relational expressions (e.g. *left* and *right*), demonstratives can only be interpreted in the context of a coordinate system, but in this case, the directional specifications are usually provided by non-linguistic means of reference. As many researchers of demonstratives (including Levinson 2004) have pointed out, *this* and *that* and *here* and *there* and their equivalents in other languages are commonly accompanied by deictic pointing gestures, eye gaze, and body postures that specify the search domain, i.e. they indicate an angle or direction between the deictic center and the intended referent, compensating for the fact that demonstratives usually do not encode angular specifications (e.g. Bühler 1934; Diessel 2006; Enfield 2009).

Note, however, that demonstratives do not generally lack this kind of information. English *this* and *that* and *here* and *there* do not express angular specifications, but there are

languages like Tauya (cf. MacDonald 1990: 102) or Lahu (cf. Matisoff 1973: 110–1) in which demonstratives indicate both distance and (vertical) direction (cf. Table 2).

There are also languages that combine demonstratives with geographical terms. A well-known example is West Greenlandic (and other Inuit languages) in which demonstratives can indicate the location of a referent in different directions along the coastline (cf. Fortescue 1984: 259–62). Another language in which spatial deictics are combined with geographical terms indicating angular specifications is Dyrbal. As can be seen in Table 3, the Dyrbal demonstratives specify whether the referent is a short, medium, or long distance uphill or downhill, upriver or downriver, or across the river from the perspective of the origo.²

Most directional morphemes that are combined with demonstratives provide information about the vertical dimension (see Diessel 1999: 42–7 and Gerner 2009 for further examples and discussion). Angular specifications at the horizontal plane are usually indicated by pointing gestures. Together with other nonverbal means of spatial reference, such as eye gaze and body posture, the pointing gestures establish a coordinate system that is indispensable for the semantic interpretation of demonstratives and that involves the same conceptual constituents (i.e. figure, ground, origin/anchor, viewer, and angular specifications) as the coordinate systems of other spatial terms (e.g. *left* and *right*). This is why Bühler characterized demonstratives (and other deictics) as ‘vectors’ that speakers use to direct the communicative partner in a ‘coordinate system of subjective orientation’ (Bühler 1934: 202).

Table 2. Demonstratives in Tauya (MacDonald 1990: 102).

Feature	Form	Meaning
Upward + proximal	<i>pise-me</i>	‘Up here’
Upward + distal	<i>pise- e</i>	‘Up there’
Downward + proximal	<i>tofe-me</i>	‘Down here’
Downward + distal	<i>tofe- e</i>	‘Down there’

Table 3. Demonstratives in Dyrbal (Dixon 1972: 48).

Feature	Form	Meaning
Downhill + proximal	<i>-bayd i</i>	‘Short distance downhill’
Downhill + medial	<i>-bayd a</i>	‘Medium distance downhill’
Downhill + distal	<i>-bayd u</i>	‘Long distance downhill’
Uphill + proximal	<i>-dayi</i>	‘Short distance uphill’
Uphill + medial	<i>-daya</i>	‘Medium distance uphill’
Uphill + distal	<i>-dayu</i>	‘Short distance uphill’
Downriver + medial	<i>-balbala</i>	‘Medium distance downriver’
Downriver + distal	<i>-balbulu</i>	‘Long distance downriver’
Upriver + medial	<i>-dawala</i>	‘Medium distance upriver’
Upriver + distal	<i>-dawulu</i>	‘Long distance upriver’
Across the river	<i>-guya</i>	‘Across the river’

Levinson excludes demonstratives from the analysis of frames of reference because the angular specifications are not (always) verbally encoded, but this is problematic if it is the goal of our research to investigate the foundations of spatial representations in language and cognition. In contrast to other spatial terms, demonstratives involve a ‘cross-modal coordinate system’ that crucially relies on nonverbal means, but without such a coordinate system, demonstratives would not be interpretable. In what follows, I argue that the coordinate system of demonstratives constitutes the most basic frame of reference grounded in universal principles of spatial and social cognition. This hypothesis is supported by cross-linguistic research on demonstratives and interdisciplinary research on pointing and joint attention.

4. *Demonstratives in Language, Communication, and Social Cognition*

Demonstratives constitute a unique class of expressions serving one of the most basic functions in language. In face-to-face conversation, they are used to establish a joint focus of attention (cf. Özyürek 1998; Burenhult 2003; Diessel 2006), which is a complex phenomenon that has been studied intensively in interdisciplinary research involving developmental psychology, cognitive primatology, and philosophy of mind (see Eilan et al. 2005 for a review).

The notion of joint attention is used to characterize triadic situations in which speaker and addressee share their attention on a particular referent. Joint attention is a prerequisite for both communication and social cognition (cf. Bruner 1983). In order to communicate, speaker and hearer must share their attention, i.e. they must be focused on the same entity or situation, which presupposes the ability to understand other people as ‘mental’ or ‘intentional agents’ (cf. Tomasello 1999). Speaker and hearer must recognize that the communicative partner is looking at the current speech situation (and other aspects of the communicative event) from a particular perspective and that social interactions and information transfer will only be successful if the communicative partners take the other person’s perspective and mental states into account (cf. Moore and Dunham 1995; Eilan et al. 2005; Tomasello 2008).

While this may appear to be a relatively simple task, developmental psychologists have emphasized that infants are unable to engage in joint attentional behaviors and that preschool children do not fully understand the subjectivity of mental states. It takes several years until children apprehend the triadic nature of communication and the reflexivity of social cognition (cf. Eilan et al. 2005; Tomasello 1999, 2008).

An important milestone of this development is the emergence of deictic pointing, which children usually acquire at around the first birthday and then soon combine with language (Capirci et al. 1996). Deictic pointing is perhaps the most basic communicative device that people of all cultures and speakers of all languages use to establish joint attention (cf. Butterworth 2003; Eilan et al. 2005). There are culture-specific differences in the morphology and social use of deictic gestures (cf. Enfield 2009), but researchers agree that pointing is a universal means of communication (cf. Kita 2003).

Deictic pointing gestures can appear with all kinds of referential expressions, but the combination with demonstratives is particularly common (e.g. Eriksson 2008). In fact, linguistic field workers have often noted that demonstratives ‘require’ an accompanying pointing gesture if they are used with reference to entities in the physical world (cf. Hellwig 2003: 263; Senft 2004: 62; see also Clark 1996: 168).

Demonstratives are among the most frequent and salient words in language; their occurrence is particularly common in face-to-face conversation, where they outnumber

other spatial expressions, notably *left* and *right*, many times. For instance, there are 14.252 tokens of *that* per million words in the spoken component of the British National Corpus (excluding non-deictic uses, e.g. complementizer *that*), but only 83 tokens of *left* (per million words), i.e. the demonstrative *that* is 172 times more frequent than the relational term *left*.³

Since demonstratives are extremely frequent and communicatively important, children begin to use them early. Although closed-class function words are almost entirely absent from early child language, demonstratives are generally among the first words children learn. They are often included in the first ten words English-speaking children produce (cf. Clark 1978) and are very frequent in early child language. Examining data from four English-speaking children between the ages of 2;0 to 3;0, Diessel (2006) found that the demonstrative *that* is by far the most frequent word these children use (on average there were 3.1 tokens of *that* per hundred words in the children's speech). The three other demonstratives, i.e. *this*, *here*, and *there*, are less frequent but still among the 15 most frequent words in Diessel's data. Since children learn the use of demonstratives in close connection with deictic pointing and other nonverbal means of reference, it seems reasonable to assume that the deictic frame of reference emerges prior to all other frames (cf. Tanz 1980). In fact, there is independent evidence that young children exclusively rely on an egocentric or deictic coordinate system when interpreting spatial information (cf. Acredolo 1988).

The particular communicative function of demonstratives is reflected in their linguistic properties (cf. Diessel 2006). Two aspects are especially important: First, in contrast to most other function morphemes, demonstratives are universal and easily identified. A unique morphological feature that distinguishes them from other function morphemes is the encoding of deictic distance specifications. As pointed out above, all languages have (at least) two demonstratives that indicate a contrast between proximal and distal referents or objects and locations near/away from the speech participants. Interestingly, the distance features of demonstratives are (often) reflected in their phonetic forms: There is a well-known tendency for proximal demonstratives to include a stem vowel at a higher and more advanced place of articulation than the corresponding distal terms (cf. Woodworth 1991; see also Sapir 1949). The demonstratives in Table 4 provide some illustrative examples.

The second aspect that characterizes demonstratives as a unique class of linguistic expressions is their history. In contrast to other spatial terms, demonstratives are very old. In the grammaticalization literature, it is commonly assumed that all closed-class function morphemes are eventually derived from content words, notably from nouns and verbs, but this hypothesis does not seem to hold true for demonstratives. Despite intensive research,

Table 4. Stem vowels of proximal and distal demonstratives.

Feature	Proximal	Distal (or medial)
English	<i>this</i>	<i>that</i>
French	<i>celui-ci</i>	<i>celui-là</i>
Hungarian	<i>ez</i>	<i>az</i>
Burmese	<i>hi</i>	<i>dou</i>
Kannada	<i>i:</i>	<i>a:</i>
Korean	<i>i</i>	<i>ku/ce</i>
Mandarin	<i>jeh</i>	<i>nah</i>
Lezgian	<i>i</i>	<i>a/at'a</i>
Nandi	<i>ni</i>	<i>na:/ni:n</i>
Jacaltec	<i>ti:</i>	<i>tu:</i>

Table 5. Features of the deictic frame of reference compared to those of the three other frames of reference.

	Anchor/origin	Ground	Angular specification	Linguistic expressions
Deictic frame	Deictic (always)	Entailed	Nonverbal (usually)	Non-derived
Relative frame	Deictic (typically)	Encoded	Verbal	Derived
Intrinsic frame	Non-deictic (typically)	Encoded	Verbal	Derived
Absolute frame	Non-deictic (typically)	Encoded	Verbal	Derived

there is no evidence that demonstratives evolved from content words (see Diessel 1999a, 2006, 2012b for discussion). In some languages, demonstratives are expressed by morphological forms that can be traced back to verbs, but it seems that these verbs were originally always used to reinforce a weakened demonstrative that later may have disappeared. In (Vulgar) Latin, for instance, the demonstrative *ille* was strengthened by the verb *ecce* ‘behold’, which is still reflected in the morphology of some present-day demonstratives in Romance languages (cf. Vulgar Latin *ecce ille* > Old French *cest cel* > French *ce*; Harris 1978: 70–77). A similar development has been proposed for several Australian languages, in which demonstratives are often based on stance verbs (e.g. ‘sit’, ‘stand’, ‘lie’) or perception verbs (e.g. ‘see’, ‘look’) (see Evans 1990 for a detailed discussion).

Reinforcement is an important mechanism of language change and not restricted to demonstratives (e.g. like demonstratives, question words are sometimes reinforced by content words, cf. Italian *che WH* > *che cosa* > *cosa*). It does not explain, however, how closed-class function morphemes have evolved (see Diessel 2003, 2006 for discussion). If we disregard cases of reinforcement, there is no evidence from any language, to the best of my knowledge, that demonstratives are based on content words like (many) other closed-class expressions, suggesting that demonstratives may be older than other function words.⁴

Both the universality and etymology of demonstratives characterize them as a particular linguistic class. Additional support for this hypothesis comes from their role in grammar and grammar evolution. Although demonstratives are not inherently specified for particular morphosyntactic features, they are commonly used as pronouns, determiners, and adverbs (see above), which are then often reanalyzed as grammatical markers. Across languages, demonstratives provide a common historical source for some of the most frequent grammatical morphemes including definite articles, third person pronouns, complementizers, relative pronouns, sentence connectives, copulas, focus markers, and a wide range of other grammatical items (cf. Diessel 1999a, 1999b, 2006, 2012a, 2012b). In the linguistic literature, it is sometimes assumed that all grammatical morphemes are ultimately derived from nouns and verbs (cf. Hopper and Traugott 2003); but this assumption is not consistent with the empirical findings. On the contrary, the available data suggest that demonstratives provide a second major source for the development of closed-class function morphemes, which is eventually motivated by their communicative function to establish joint attention (cf. Diessel 2006, 2012b).

5. Conclusion

In summation, we have seen that the semantic interpretation of demonstratives presupposes a coordinate system with the same conceptual constituents as the coordinate systems of other spatial expressions (i.e. figure, ground, viewer, origin/anchor, and angular specifications),

indicating that demonstratives have to be included into the cross-linguistic analysis of frames of reference. In fact, there are reasons to assume that the coordinate system of demonstratives is of particular importance for spatial language and cognition.

As argued in the previous section, demonstratives constitute a unique class of linguistic expressions that all languages use for spatial orientation. In contrast to other spatial terms (cf. Heine et al. 1991; Svorou 1994), demonstratives are truly universal and very frequent in everyday language (cf. Diessel 1999a; Dixon 2003). The universality and frequency of demonstratives are closely related to their communicative function to establish joint attention, for which speakers of all languages employ an egocentric coordinate system that is anchored by the speaker's body at the time of the utterance. In contrast to relational expressions such as *left* and *right* and *in front of* and *behind*, demonstratives are inherently deictic and cannot be used across different types of frames of reference. If they are combined with relational or geographical terms, the coordinate system remains deictic. Research on child (language) development has shown that children acquire this coordinate system very early, and research on grammaticalization suggests that demonstratives are very old and part of the basic vocabulary of every language.

Taking all of these aspects into account, it seems reasonable to assume that the coordinate system of demonstratives has a particular status in language and cognition. It constitutes the most basic frame of reference, for which I propose the traditional notion of 'deictic frame of reference'. In contrast to all other frames of reference, the deictic frame of reference is generally anchored by the speaker's body, i.e. the speaker's bodily orientation provides the origin or anchor of the coordinate system, but this is not the only aspect that distinguishes the deictic frame of reference from other coordinate systems.

As we have seen in Section 3, in contrast to expressions such as *left* and *right* and *in front of* and *behind*, demonstratives do not combine an explicit figure with an explicit ground but indicate the location of the figure relative to an implicit ground, i.e. the deictic center, which is 'entailed' by the demonstrative. This involves a particular mode of reference: Relational expressions such as *left* and *right* and *in front of* and *behind* 'describe' spatial relations between symbolic terms, whereas demonstratives indicate a referential link between figure and ground by way of 'pointing' (cf. Bühler 1934; Lyons 1977). Moreover, demonstratives do not usually encode angular specifications; rather, directional information is typically provided by nonverbal means of reference such as gesture, eye gaze, and body posture. And finally, the deictic frame of reference involves a class of linguistic terms that is truly universal and non-derivative. In contrast to all other spatial expressions (including *left* and *right*), demonstratives are generally so old that their roots cannot be traced back to other lexemes. Table 5 provides an overview of these features.

T5

Note that the relative frame of reference is very different from the deictic frame of reference. Although both types of frames are (usually) deictic, the relative frame of reference has also a non-deictic interpretation (see above). As Levinson notes, the relative frame of reference is a very complex system. It is the only frame of reference in which origin/anchor and ground are represented by different entities creating a logical structure with three arguments (see above), and it often involves secondary coordinates that are mapped from the viewer or deictic center onto the ground, as in the sentence *John is in front of the tree*, in which the ground, i.e. 'the tree', is conceptualized as an entity with an inherent front-back orientation derived from the viewer's coordinates through 180 degrees rotation (cf. Levinson 2003: 44–5). Children have great difficulties with the relative frame of reference and acquire it late (Johnston and Slobin 1979), and many languages do not use it at all (cf. Levinson 2003: 46). All this suggests that the relative frame of reference is more complex and less general than other frames of reference, in particular, the deictic frame of reference.

Interestingly, Levinson suggests that the relative frame of reference can be seen as an extension of the intrinsic frame of reference: ‘relative systems seem to originate as extensions of intrinsic ones’ (Levinson 2003: 47). Of course, the intrinsic frame of reference involves an object with inherent spatial orientation that is often, though not generally, modeled according to the human body, e.g. a car has an inherent left/right and front/back orientation parallel to the left/right and front/back orientation of the human body, but once such an object-oriented frame of reference is established, it can be extended to the viewer or some other person who is then treated as an object with an inherent orientation providing the origin of an intrinsic frame of reference parallel to a car (or camera). This is what seems to have given rise to the relative frame of reference, in which the viewer does not have the status of an actor or agent but of an entity with an inherent orientation.

If we follow this analysis and think of the relative frame of reference as an extension or subtype of the intrinsic frame of reference, we have come full circle and have returned to our starting point, i.e. the traditional three-way distinction between a deictic frame of reference, an intrinsic frame of reference, and an absolute (or extrinsic) frame of reference (cf. Section 2). In this typology, the deictic frame of reference provides the most basic coordinate system of language and cognition that instantiates most clearly the egocentric, body-oriented perspective, which has always been considered a central aspect of spatial language and cognition.

The cross-linguistic differences that Levinson and colleagues observed do not concern the deictic frame of reference but only the two other frames. On the account presented in this paper, the difference between languages like English and languages like Tzeltal boils down to the difference between languages in which the intrinsic frame of reference has been extended to the relative frame of reference (e.g. English) and languages in which this is not the case (e.g. Tzeltal). While this is an important contrast, it does not challenge the predominance of egocentric representation in language and cognition, which, interestingly, can also be observed in languages like Tzeltal. As Danziger (2010: 176) points out, although some languages (e.g. Tzeltal) completely lack the relative frame of reference, the speakers of these languages ‘sometimes solve rotation puzzles in an Egocentric fashion’ (see also the results in Pederson et al. 1998), which is completely unexpected if we assume that they are not familiar with egocentric representations (and that language influences spatial cognition), but since all languages make common use of demonstratives, it is a very plausible hypothesis that Tzeltal speakers and speakers of other languages that lack the relative frame of reference are influenced by the deictic frame of reference when solving rotation problems.

Indirect support for this hypothesis comes from a recent study by Li et al. (2011), who carried out a series of new rotation experiments with Tzeltal speakers in which they did not find any evidence for the alleged predominance of the absolute frame of reference in this culture. On the contrary, using different rotation tasks than Levinson and colleagues, in which they tried to minimize the influence of pragmatic factors on the subjects’ performance, they found that ‘Tzeltal speakers appear to have greater facility representing relationships between objects using egocentric, body-derived coordinates than geocentric, environmentally-stable ones’ (Li et al. 2011: 50). Moreover, they report that their participants made frequent use of demonstratives (i.e. *li’e* there) (experiment 4) and deictic pointing gestures based on an egocentric frame of reference (experiment 3).

To conclude, Levinson and colleagues discovered some unexpected differences in the cross-linguistic encoding of space, indicating that there is more diversity in this domain than previously assumed. However, contrary to what they claim, their research does not challenge long-standing assumptions about the predominance of an egocentric perspective in spatial language and cognition. While there are languages that make more common use of fixed

coordinates and cardinal directions in spatial descriptions than familiar European languages, the most basic class of linguistic expressions that all languages use for spatial orientation, i.e. demonstratives, are generally analyzed in the context of a deictic, body-centered frame of reference that is fundamentally rooted in the general principles of communication and spatial/social cognition.

Short Biography

Holger Diessel received his PhD in Linguistics from the University of Buffalo in 1998 and is currently a professor of English Linguistics at the University of Jena. Before coming to Jena, he was a post-doc in the Department of Developmental and Comparative Psychology at the Max Planck Institute for Evolutionary Anthropology, Leipzig. His research is concerned with the emergence of linguistic structure in language change and language acquisition. He has authored and co-authored papers for *Language*, *Linguistics*, *Cognitive Linguistics*, *Journal of Child Language*, *Linguistic Typology*, and various other journals. He has also published two books: *Demonstratives: Form, function, and grammaticalization* (1999) and *The Acquisition of Complex Sentences* (2004).

Notes

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¹ The term 'origo' (or deictic center) is related to what Levinson and colleagues call the 'origin' of a frame of reference (see above). However, since Levinson and colleagues deny that deictic expressions invoke a frame of reference, the notions of 'origin' and 'origo' will be kept separate.

² An especially interesting system of spatial terms can be found in Kayardild, in which 'compass locationals' indicating cardinal directions (e.g. *rara* 'south', *riya* 'east') receive deictic interpretations when used in particular constructions (cf. Evans 1995: 206–227).

³ Other demonstratives are somewhat less frequent in the BNC, but still outnumber *left* and *right* many times: *this* = 5.267 tokens per million words, *there* = 2.894 tokens per million words, and *here* = 1.640 tokens per million words. The token frequency of *right* is difficult to determine because *right* has also non-spatial uses that are not distinguishable from spatial uses in the BNC; however, there is no reason to assume that the spatial use of *right* is strikingly more frequent than (the spatial use of) *left*.

⁴ Heine and Kuteva (2007: 111) argue that demonstratives are derived from spatial adverbs, notably from expressions such as *here* and *there*, but if we include these expressions in the class of demonstratives (because they often include the same deictic roots and serve similar pragmatic functions; see above), this analysis does not account for the diachronic origins of demonstratives.

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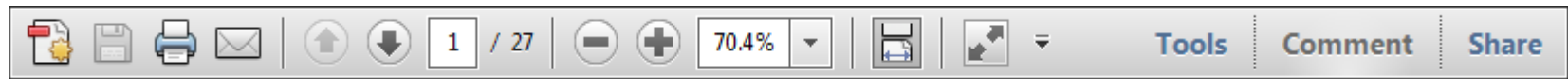
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Q13	AUTHOR: Please provide the city location of publisher for Reference Evans (1990).	
Q14	AUTHOR: Please provide the city location and publisher name for Reference Tenbrink and Kuhn (2011).	

USING e-ANNOTATION TOOLS FOR ELECTRONIC PROOF CORRECTION

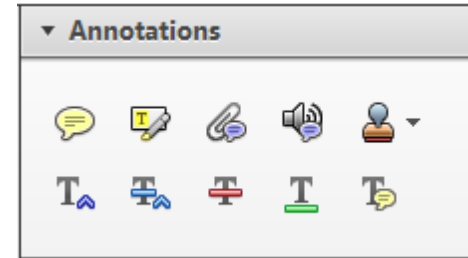
Required software to e-annotate PDFs: Adobe Acrobat Professional or Adobe Reader (version 7.0 or above). (Note that this document uses screenshots from Adobe Reader X)

The latest version of Acrobat Reader can be downloaded for free at: <http://get.adobe.com/uk/reader/>

Once you have Acrobat Reader open on your computer, click on the [Comment](#) tab at the right of the toolbar:



This will open up a panel down the right side of the document. The majority of tools you will use for annotating your proof will be in the [Annotations](#) section, pictured opposite. We've picked out some of these tools below:



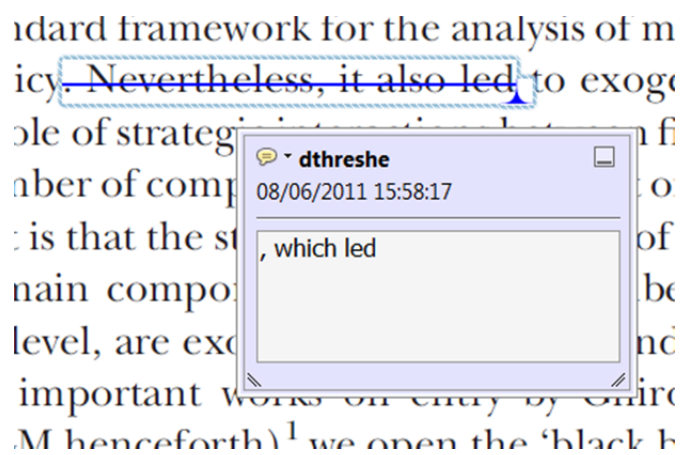
1. Replace (Ins) Tool – for replacing text.



Strikes a line through text and opens up a text box where replacement text can be entered.

How to use it

- Highlight a word or sentence.
- Click on the [Replace \(Ins\)](#) icon in the Annotations section.
- Type the replacement text into the blue box that appears.



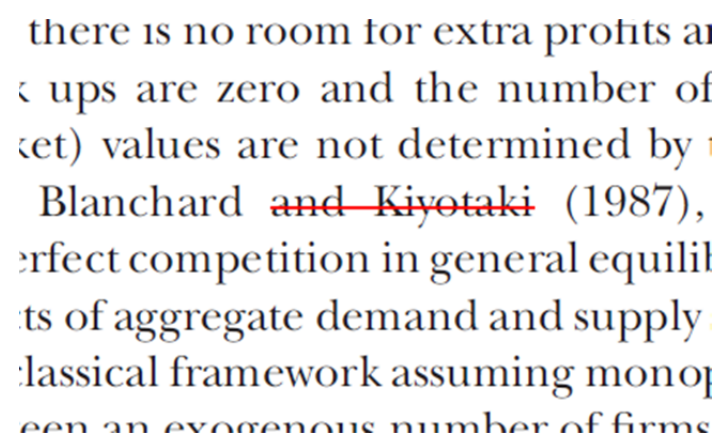
2. Strikethrough (Del) Tool – for deleting text.



Strikes a red line through text that is to be deleted.

How to use it

- Highlight a word or sentence.
- Click on the [Strikethrough \(Del\)](#) icon in the Annotations section.



3. Add note to text Tool – for highlighting a section to be changed to bold or italic.

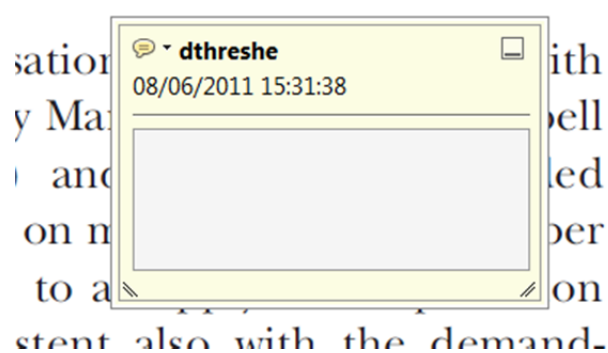


Highlights text in yellow and opens up a text box where comments can be entered.

How to use it

- Highlight the relevant section of text.
- Click on the [Add note to text](#) icon in the Annotations section.
- Type instruction on what should be changed regarding the text into the yellow box that appears.

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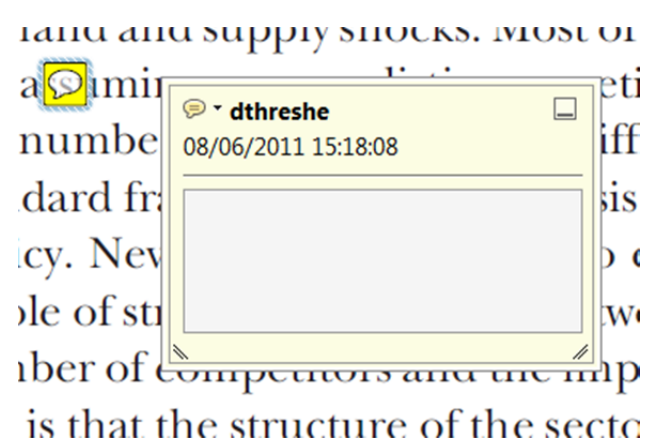
4. Add sticky note Tool – for making notes at specific points in the text.



Marks a point in the proof where a comment needs to be highlighted.

How to use it

- Click on the [Add sticky note](#) icon in the Annotations section.
- Click at the point in the proof where the comment should be inserted.
- Type the comment into the yellow box that appears.



USING e-ANNOTATION TOOLS FOR ELECTRONIC PROOF CORRECTION

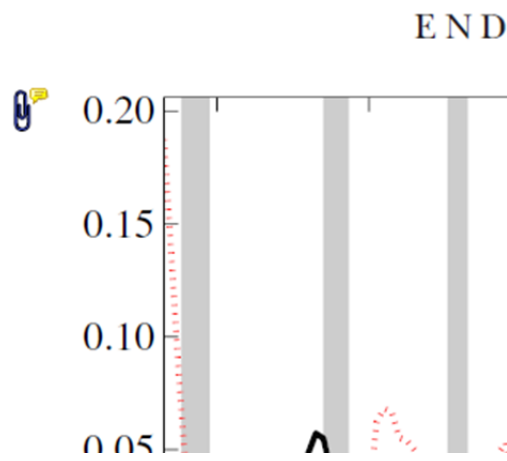
5. Attach File Tool – for inserting large amounts of text or replacement figures.



Inserts an icon linking to the attached file in the appropriate place in the text.

How to use it

- Click on the [Attach File](#) icon in the Annotations section.
- Click on the proof to where you'd like the attached file to be linked.
- Select the file to be attached from your computer or network.
- Select the colour and type of icon that will appear in the proof. Click OK.



6. Add stamp Tool – for approving a proof if no corrections are required.

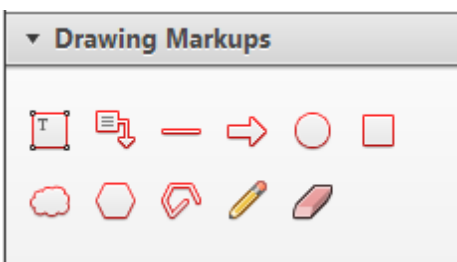


Inserts a selected stamp onto an appropriate place in the proof.

How to use it

- Click on the [Add stamp](#) icon in the Annotations section.
- Select the stamp you want to use. (The [Approved](#) stamp is usually available directly in the menu that appears).
- Click on the proof where you'd like the stamp to appear. (Where a proof is to be approved as it is, this would normally be on the first page).

of the business cycle, starting with the
 on perfect competition, constant return
 production. In this environment goods
 extra profits and the number of firms
 he number of firms is determined by the model. The New-Key
 otaki (1987), has introduced product
 general equilibrium models with nomin
 ed and supply shocks. Most of this literat

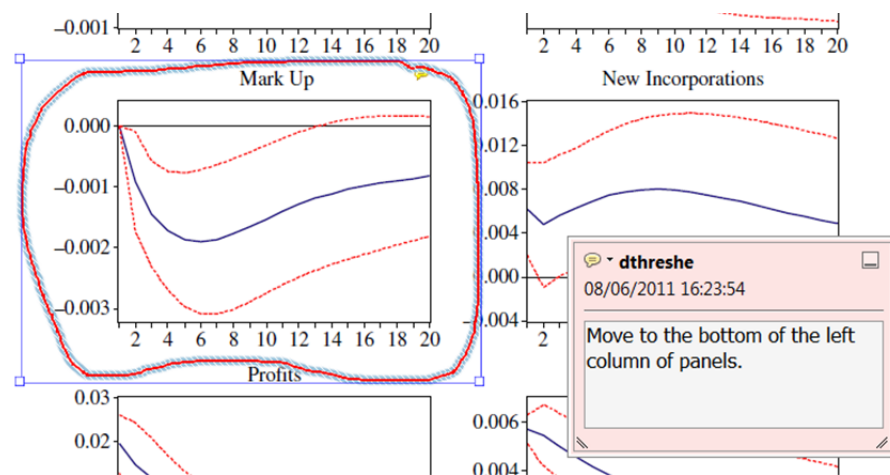


7. Drawing Markups Tools – for drawing shapes, lines and freeform annotations on proofs and commenting on these marks.

Allows shapes, lines and freeform annotations to be drawn on proofs and for comment to be made on these marks..

How to use it

- Click on one of the shapes in the [Drawing Markups](#) section.
- Click on the proof at the relevant point and draw the selected shape with the cursor.
- To add a comment to the drawn shape, move the cursor over the shape until an arrowhead appears.
- Double click on the shape and type any text in the red box that appears.



For further information on how to annotate proofs, click on the [Help](#) menu to reveal a list of further options:

