Social and Personality Psychology Compass 3 (2010): 1–10, 10.1111/j.1751-9004.2010.00271.x

Judging Faces in Context

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Abstract

Previous judgment studies of facial expressions of emotion in context have provided mixed results. These contradictory findings arise, in part, because of a lack of consideration of the different aspects of context with which facial expressions of emotion can be combined, and different meanings of face-context pairings vis-à-vis real-life phenomena. In this paper, we provide a framework of how faces and contexts combine and describe possible meanings of consistent and inconsistent face-context pairings. We also discuss methodological caveats that should be considered in the conduct of such judgment studies. We argue that future research in this area will benefit not from more studies of different combinations of stimuli created merely because we have the technological ability to create them, but instead from careful consideration of the ecological validity of the various types of combinations that can be produced, and their meaning.

Judging Faces in Context

Despite the fact that facial expressions always occur in context in real life, most judgment studies present them fairly acontextually. For example, in many cross-cultural judgment studies of faces, which serve as the backbone for findings concerning the universality of facial expressions of emotion (Biehl et al., 1997; Ekman & Friesen, 1971; Ekman et al., 1987; Izard, 1971), observers typically see only a face, and not any other cue such as the body or situation in which the expressor is in. Observers are typically given no information concerning what happened to cause the expression they are judging.

There have been many studies that have paired faces with contexts and have examined the relative importance of each in contributing to emotion messages. They have produced conflicting results. Some have supported a context superiority hypothesis, where emotions inferred from context are more important than emotions portrayed in the face (Carroll & Russell, 1996; Fernberger, 1928; Russell & Fehr, 1987). Others have argued for *face superiority*, where messages gleaned from the face override messages obtained from context (Ekman & O'Sullivan, 1988; Ekman, O'Sullivan, & Matsumoto, 1991; Frijda, 1969; Goldberg, 1951; Nakamura, Buck, & Kenny, 1990). Others have advocated an *additive effect*, suggesting that judgments of emotion are more accurate and reliable when information about context is incorporated (Aviezer et al., 2008; Bruner & Tagiuri, 1954; Knudsen & Muzekari, 1983; Meeren, van Heijnsbergen, & de Gelder, 2005). Some have argued for none of these (Fernandez-Dols, Sierra, & Ruiz-Belda, 1993; Goodenough & Tinker, 1931; Munn, 1940; Vinacke, 1949).

At least part of the inconsistencies in these findings is rooted in differences in the types of face-context pairings that have been used in previous research, and what those different pairings mean. This line of study begs the question of what kinds of pairings occur, when do consistencies and inconsistencies occur in them, and what do they mean? Here, we provide a theoretical analysis of these questions, heretofore unaddressed in the

SPC 3 2 7 1 B
Journal Name Manuscript No.
Dispatch: 8.3.10 No. of pages: 10
Toc head: Culture & Diversity
CE: Valarmathy, G
PE: Yasmin, S

literature. Such an analysis can provide a framework for understanding findings generated in this area, a guideline with which to evaluate the ecological validity of such studies, and a roadmap for future studies.

A Framework for Understanding Face-Context Combinations

A classification of face-context combinations

Contexts in which facial expressions occur can have many characteristics, including the faces that occur before or after a target face; the faces that occur in other people around a target person; other cues in the face or head area (e.g., hairstyle, glasses, facial hair, etc.); other cues in body postures and gestures; who else is involved; the physical setting in which the expression is occurring; the nature of the emotion trigger; or words associated with the facial expressions. These context characteristics can be congruent or incongruent with the facial expression.[1] The first issue to consider, therefore, concerns the specific aspect of context linked with the face, because different types of linkages refer to different real-life phenomena. Combining faces with information about what triggered an emotion (e.g., via verbal descriptions, a commonly used methodology in the past; see Ekman, Friesen, & Ellsworth, 1972; Fernandez-Dols et al., 1993; Frijda, 1969; Goodenough & Tinker, 1931; Knudsen & Muzekari, 1983) is what we term *Face-Trigger Linkage*, because in these cases, the facial expressions are considered to be the expresser's reactions to the eliciting trigger. Thus, seeing sad faces in relation to a situation that elicits sadness will give the impression that the expresser's reaction was indeed sad; seeing angry faces in that same situation would suggest that the expresser reacted with anger.

Linking faces with other bodily responses, a methodology employed by some (Aviezer et al., 2008; Meeren et al., 2005), refers to *Response Coherence*. This notion originates in an evolutionary view of emotional responses as an organized and coordinated package of events that prepare individuals for action by priming whole body and cognitive systems (Darwin, 1872/1998; Levenson, 1999; Tooby & Cosmides, 2008). Thus, angry facial expressions, with brows lowered, eyes glaring, and lips tightened, occur along with an edge in the voice, puffed up body, fists, increased heart rate, increased vigilance for other angry signals, and aggressive cognitions, all of which prepare individuals for battle. (Of course, whether these impulses transform to action in humans is dependent on a host of culturally and individually learned factors; see Matsumoto & Wilson, in press.)

Context has also been operationalized in the past by manipulating the facial emotions seen prior to the target emotional expression to be judged (Carroll & Russell, 1996; Ekman et al., 1991; Goldberg, 1951; Russell & Fehr, 1987). We call this *Face Contrast,*[2] because the judged target expression is the last of a series of emotional expressions seen. Thus, judging sad expressions after a neutral one is different than judging the same sad expression after a happy one.

A fourth type of methodology that has been employed compares judgments of a target face by itself compared to a larger angle shot of it that includes more information (Munn, 1940; Vinacke, 1949), or a target expresser's face imbedded with the faces of others (Masuda et al., 2008). We refer to this as *Face Imbedding,* because the central question asked by judgments of the target face concerns the degree to which the face is coordinated with other elements imbedded in the immediate surroundings that may affect emotion signals (see Table 1 for a summary of the four classifications).

We do not intend for these classifications to be the best or only classifications available. Our point here is that faces can be combined with many different aspects of context, and

Table 1 Summary of the face-context combinations studied to date in the literature

Type	Description	Nature of the Congruent/Incongruent Manipulations
Face – Trigger Linkage	A target face is presented with information about the circumstances or event that supposedly elicited the target face	The information about the eliciting circumstances or the facial expressions are manipulated so that they are congruent or not with each other
Response Coherence	A target face is presented with other bodily responses of the same expressor, including postures and gestures	The facial expressions or bodily responses are manipulated so that they are congruent or not with each other
Face Contrast	A target face is presented in a specified order after other distractor faces are presented	The distractor faces are manipulated so that they are congruent or not with the target facial expression
Face Imbedding	A target face is imbedded within a larger image that involves information about what is occurring around the target face, including the faces of others	The surrounding context information (e.g., faces of others) is manipulated so that it is congruent or not with the facial expression

different pairings may mean different things. Thus, it might behoove researchers evaluating previous literature in this area, or in planning future studies, to consider the specific type of face-context pairing and its relevance and meaning vis-à-vis real-life phenomena.

When do congruent and incongruent combinations occur?

In considering the meaning of the specific type of face-context pairing, it is necessary to consider how congruent and incongruent pairs occur, and the meaning of the occurrence. Congruence in Face-Trigger Linkage and Response Coherence is predicted from evolutionary theories of emotion (Darwin, 1872/1998; Levenson, 1999; Tooby & Cosmides, 2008) that posit that emotions are information processing systems that have come to be reliably associated with certain types of eliciting event triggers through our evolutionary history and a process of natural selection. These triggers may include physical stimuli (e.g., loss of balance, coiled objects in grass, sounds of animal growls at night) or their underlying psychological themes (e.g., achievement, separation, goal obstruction; Lazarus, 1991, called these core relational themes). Over time, the triggers became associated with specific emotions, so that they reliably elicit those emotions, and their expressions, when they occur. The trigger of achievement, for instance, should elicit joy (and thus a happy face), while the trigger of loss should elicit sadness (and thus a sad face). Growling sounds at night should elicit fear (and thus a fearful face), while someone's stealing of one's possessions should elicit anger (and thus an angry face). Emotion triggers, therefore, should reliably elicit emotions and their associated expressions (thus Face-Trigger Linkage).

Evolutionary theories of emotion also predict that once elicited, emotions recruit a package of events – physiological, cognitive, experiential, and expressive – that prepare the individual to adapt to the eliciting event by priming the mind and body for action. This package of events needs to be coordinated and organized to aid in whole-body action (e.g., running away, attacking), otherwise they would not be effective in facilitating adaptation. Thus, when anger is elicited, the angry facial expression should occur with elevated heart rate, increased blood flow to the hands, the making of fists, and an

edge in the voice, all of which is part of a package of whole-body responses when anger is elicited. Likewise, when fear is elicited, the fearful facial expression should occur with elevated heart rate, increased blood flow to the legs, and vasoconstriction. Facial expressions, therefore, should be coordinated with and related to the other physiological and bodily reactions that occur as part of the emotional response package (thus Response Coherence).

Incongruence in Face-Trigger Linkage and Response Coherence can and do occur, and are not incompatible with evolutionary theories of emotion. All accounts of the evolutionarily based emotion system, for instance, suggest that the system is an open, not closed, program (Mayr, 1974), capable of learning new schema and thus, expanding the database of events that trigger emotion. Emotional learning occurs as individuals associate events available in their cultural environment with emotions, allowing for the production of a wide range of individual and cultural differences in Face-Trigger Linkage to culturally available events. That is, the same event trigger may elicit anger in one person but sadness in another, or anger in one cultural group but sadness in another, thus producing incongruent Face-Trigger Linkage (thus creating individual and cultural biases).

Moreover, the concept of display rules (Ekman & Friesen, 1969) suggests that emotional responses may not match the emotions actually felt because individuals are regulating their expressive behavior according to social circumstances. For instance, depending on context, individuals may learn it is OK to show their feelings when angry, but in another context, it is not. In the latter, the expression may be inconsistent with the eliciting trigger or the other emotional responses (e.g., physiology); in fact, data show a decoupling of response coherence in such situations (Matsumoto & Kupperbusch, 2001). Another such context in which Face-Trigger Linkage or Response Coherence may be decoupled is in high stakes situations involving lies, because individuals exert great efforts to control their expressive behavior despite feeling strong emotions (Ekman, 1985; Ekman, Friesen, & O'Sullivan, 1988; Frank & Ekman, 1997; Porter & ten Brinke, 2008). Thus, incongruence in Face-Trigger Linkage and Response Coherence is not incompatible with evolutionary theories of emotion.

Incongruence in Face Contrast can occur for several reasons, one of which is based in display rules. For example, some data indicate that when strong emotions are aroused but the context may not allow for their display, individuals may display nothing or even other expressions (e.g., a smile), and these may occur subsequent to an initial display of an emotion, thus changing the displays of emotion in the same individual across time (D. Matsumoto, H.-S. Hwang, H. Yamada, K. Takabatake, & H.-R. Lee, unpublished data #2784). Face Contrast may also occur because individuals have multiple emotional reactions to an eliciting trigger, and cycle through them in succession. Or, individuals may have emotions in response to their emotions (e.g., feeling sad about being angry) and thus, may cycle through different emotional reactions across time. From the observer's perspective, which corresponds to the studies on this topic conducted to date, Face Contrast occurs whenever an observer sees different people with different emotional states sequentially.

Finally, incongruence in Face Imbedding may occur when individuals are in groups but react to emotion-eliciting stimuli differently. If, for example, a group of individuals observe an act of violence and all react in horror, an observer viewing this group may notice the congruence in response. But, because of individual differences in emotional response, some may respond with horror, others with anger, others with distress, and others with nothing, all of which may occur because of individual differences in learned emotion triggers. An observer viewing this group may see incongruence in Face Imbedding.

What do judgment studies of congruent and incongruent face-context pairings inform us about?

Judgment studies of congruent Face-Trigger Linkage and Response Coherence are important because they test characteristics of evolutionary theories of emotion, which would predict an additive effect on judgments. For example, although cross-cultural judgment studies of universal facial expressions of emotion demonstrate high agreement in judgments across cultures (Elfenbein & Ambady, 2002; Matsumoto, 2001), agreement is never perfect, and there are cultural differences in absolute levels of that agreement (Matsumoto, 1989, 1992). As mentioned earlier, however, faces always occur in context, and it is very likely that when universal facial expressions of emotion are judged in emotion-eliciting contexts that are congruent with the face, or when judged with other emotional responses (e.g., whole-body action) that are congruent with the face, the agreement rates are likely to be higher than when any signal source is viewed singly.

Judgment studies of incongruent face-context combinations are also important because they inform us of learned biases in perception. That is, because incongruent Face-Trigger Linkage, Response Coherence, Face Contrast, or Face Imbedding occurs because of learned emotional responding or response regulation in the first place, judgments of them are likely to reflect individual and cultural biases associated with that learning. When viewing a happy face in a situation that normally would elicit anger, for instance, judges may be likely to infer that the happy face is a mask (that is learned) that hides the expresser's true feelings of anger and may judge the person to be feeling anger despite showing a smile. In this case, the judgment of anger is made on the basis of a learned attribution of the smile as a learned mask, and not as a signal of true enjoyment.

Cross-cultural judgment studies of congruent and incongruent Face-Trigger Linkage or Response Coherence add additional value to these issues. On one hand, evolutionary-based theories of emotion would predict that congruent pairings of Face-Trigger Linkage or Response Coherence should produce an additive effect in all cultures, thereby eliminating or reducing cultural differences in absolute agreement rates for any one source. In fact, a recent study comparing American, Japanese, and Korean observers' responses to congruent face-trigger pairings indeed produced very high agreement rates and eliminated cultural differences (D. Matsumoto, H.-S. Hwang, H. Yamada, K. Takabatake, & H.-R. Lee, unpublished data).

On the other hand, cross-cultural judgments of incongruent Face-Trigger Linkage or Response Coherence can inform us about cultural differences in the learned biases of attributing emotions in these situations. These differences may be manifest in differences in direction, in which members of one culture demonstrate face superiority whereas members of another culture demonstrate context superiority to the same incongruent combination; or they may be manifest in differences in degree, where members of all cultures demonstrate face (or context) superiority, but to varying degrees. In either case, these differences highlight differences in learned biases in emotion perception and attribution. Thus, Masuda et al. (2008) clever study of response coordination tell us about important cultural biases concerning emotion perception and attribution in a Face Imbedding paradigm.

At the same time, it is important to be clear about what judgment studies of incongruent face-context combinations cannot inform us about. A common assumption that is made in this area is that examination of incongruent face-context combinations tests the validity of evolutionarily based theories of emotion and that evidence for context superiority (or the lack of face superiority) is evidence against evolutionary-based emotion theories that posit universality of facial expressions of emotion (and other bodily responses).

That's not the case, however, because as mentioned earlier, evolutionary-based theories allow for individual and cultural learning of emotional responding and coherence that produces incongruence to occur in the first place. Incongruence occurs precisely because of learning that is allowed within an adaptive evolutionary framework. Thus, judgments of incongruent stimuli can provide evidence concerning the nature of the individual and cultural biases that occur during learning, but cannot comment on the validity of evolutionary-based emotion theories.

Methodological Issues

Another possible reason for conflicting results in the literature may be the lack of agreement about methodological standards that should be used to examine the relative contribution of face and context in emotion judgments. Ekman et al. (1972), for example, argued that ''understanding judgments of combined sources requires research on the information from each source alone as well as from the combination of sources and that experiments on this problem must therefore provide three values; judgments from the face alone, from context alone, and from face within context, viz., the combination'' (pp. 13-14). We agree; without data concerning source clarity in the face and context separately, it is impossible to know what effect the combination had on emotion judgments.[3] For this reason, it is impossible to draw definitive conclusions from a number of studies (e.g., Goldberg, 1951; Goodenough & Tinker, 1931; Knudsen & Muzekari, 1983; Munn, 1940; Vinacke, 1949), because these reports did not include data concerning source clarity. Moreover, in examining the relative contribution of face and context, one would need to ensure that the source clarities from the face and context were equivalent (unless the study was designed a priori to examine inconsistent messages that were nonequivalent in clarity), especially in a cross-cultural design (Matsumoto & Yoo, 2006).

In addition to source clarity, studies examining the relative contribution of face and context should meet other methodological criteria, some of which have been discussed in the literature. For example, facial stimuli should include multiple expressers and contexts, so that findings are not limited to the specific stimuli used (Ekman et al., 1991), as well as multiple emotions, not just one. Indeed, some studies have used only one or very limited numbers of facial stimuli (Carroll & Russell, 1996; Frijda, 1969; Goldberg, 1951; Goodenough & Tinker, 1931; Russell & Fehr, 1987), making it difficult to draw definitive conclusions from them.[4]

Here, we introduce a new methodological criterion that should be considered: the analysis of data using confusion matrices and the aggregation of data across meaningful emotion combinations. Many studies (Aviezer et al., 2008; Carroll & Russell, 1996; Fernandez-Dols et al., 1993; Knudsen & Muzekari, 1983; Russell & Fehr, 1987) ask observers to judge emotions by selecting an emotion term from a list (e.g., anger, disgust, fear, happiness, sadness, and surprise). Yet, no study to date reports a full confusion matrix of the data with the percentage of observers selecting each of the response alternatives vis-à-vis each face-context combination. Instead, analyses typically focus on the target emotion labels in either the face or context and ignore the information in the other terms. This analytic strategy does not provide an optimal view of the data. For example, observers may be presented with an inconsistent happy face + angry-context combination. Examining the percentage of observers who selected the terms happiness or angry is clearly informative. But an analysis of a combined anger-contempt-disgust category is also informative, given their semantic overlap and confusions observers have when judging emotions with these terms (Matsumoto, 2005). An analysis of this

combination and a combined total negative emotion category is also informative because the selection of *any* of these terms would be indicative of a context effect, given that the face displayed happiness. For example, in an incongruent happy face-angry-context combination, the selection of any negative emotion could be construed as evidence for a context effect.

In fact, a recent study showed that findings differed depending on how data were analyzed (D. Matsumoto, H.-S. Hwang, H. Yamada, K. Takabatake, & H.-R. Lee, unpublished data). When American observers were shown combinations of happy faces and anger-eliciting vignettes, analysis of just the anger and happiness response categories indicated a face superiority effect; more participants rated the expressor as happy than angry. But when anger, contempt, and disgust were combined, or when all negative emotions were combined, the data indicated a context superiority effect. A context superiority interpretation is probably more appropriate in this situation because, as mentioned earlier, the selection of any negative emotion in response to this pairing is likely to reflect the effect of the anger-eliciting vignette.

Moreover, lack of response coherence (e.g., disgusted face and a neutral body posture) is different than *response mixing* (e.g., disgusted face and fear body posture with head and body back and arms up in a defensive move). Clearly, response incoherence can and does occur because individuals' attempts at expressive behavior regulation may be more successful in one area of the body than others when an emotion is aroused. There is evidence in the literature that such incoherence may occur across different response components such as expressions and physiology (Mandler, Mandler, Kremen, & Sholiton, 1961; Weinstein, Averill, Opton, & Lazarus, 1968), expressions and subjective experience (Fernandez-Dols et al., 1993; Schneider & Josephs, 1991; Schneider & Unzner, 1992), and the like. But it is not clear that response mixing occurs. That is, there are no data to suggest that strong facial expressions of one emotion are displayed when that same person is behaviorally engaging in a full-body response of another emotion simultaneously. Clearly, an incongruent facial expression can occur before or after a full-body response of another emotion because people can have different emotions rapidly and in succession, and because people have immediate emotional reactions to their own emotions. But whether individuals actually produce the face of one emotion while their bodies are simultaneously in a full-body response of another is questionable. This is precisely the type of stimuli, however, that some recent studies have utilized (Aviezer et al., 2008; Meeren et al., 2005). Clearly, researchers today have the technological capability to mix and match many different types of stimuli for judgments. But, just because researchers can produce a combination does not necessarily mean that it has relevance to the real world, and stimuli need to be carefully considered with regard to their ecological validity.[5]

Conclusions

There are many aspects of "context," and combinations of different aspects of context with facial expressions of emotion refer to different real-life phenomena. The classifications we offer in this paper may not be the best, and they certainly are not the only ones. We offer them as suggestions to allow the field to consider more carefully what face-context pairings mean. Given today's technological capabilities, it is very easy to create all kinds of face-context combinations. The problem is that some of those combinations may not actually occur in real life, and there may be major differences in the nature, function, and meaning of those that do occur. Future research in this area will benefit not from more studies of different combinations of stimuli created because we can create

them, but from careful consideration of the ecological validity of the various different types of combinations that can be produced, and their meaning. When such crafted stimuli are used in judgment studies, we need to remember that participant observers will rate anything that we ask them; whether such judgments are meaningful to any real-life phenomena is another story.

Short Biogrphies

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Author Note

David Matsumoto and Hyi-Sung Hwang, Department of Psychology, San Francisco State University. Portions of this report were prepared with the support of research grant W91WAW-08-C-0024 from the Army Research Institute to the first author. We thank Katherine Sorenson, Patricia Gums, and Brie Pfisterer for their assistance in the general laboratory program.

Endnotes

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[1] Research comparing the relative contribution of verbal and nonverbal behavior is a type of face-context comparison, but addresses a different question than research examining face-context combinations, and will not be addressed in this article. Research examining judgment differences as a function of expressor sex, culture, age, or other demographic characteristics could conceivably be considered another type of face-context comparison; yet these studies do not involve the pairing of a facial expression with context and ask fundamentally different questions than the methodology considered here. Those studies ask ''how does the meaning of the facial expression differ as a function of expressor sex, age, culture, etc.?'' The studies we consider in this review ask the question ''how does the meaning of the facial expression differ when it occurs in different contexts?'' We limit ourselves in this article to studies involving pairings of face with a context.

[2] This term was suggested by an anonymous reviewer.

[3] Source clarity refers to which emotion signals are unambiguously expressed on the face. For example, an expression with a strong, full-face, prototypic expression of an emotion, with no other muscle movements, would be considered high in source clarity. An expression with a low intensity expression depicted in only part of the face (e.g., upper or lower half) that included other muscle movements (head movements, muscles related to speech, etc.) would be considered lower in signal clarity.

[4] An additional requirement must be the inclusion of sufficient sample size for statistical power and for generalizability. We note several recent reports with fairly small sample sizes, which raise questions about both (e.g., N = 16 in Aviezer et al., 2008; N = 39 Americans and 36 Japanese in Masuda et al., 2008; N = 12 in Meeren et al., 2005).

[5] The same issue exists with computer morphing technologies of facial expressions, which create new expressions based on the combination of existing expressions. Typically these techniques involve researchers identifying common landmarks on two different expressions, and rendering a new expression by averaging the landmarked points. The problem with this technology is that averaged landmarked faces may be technically possible but anatomically impossible. Thus, such stimuli need to be checked in terms of their ecological validity to anatomically possible expressions in real life, in addition to usage and meaning.

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Author Query Form

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Dear Author,
During the copy-editing of your paper, the following queries arose. Please respond to these by marking up your proofs with the necessary changes/additions. Please write your answers on the query sheet if there is insufficient space on the page proofs. Please write clearly and follow the conventions shown on the attached corrections sheet. If returning the proof by fax do not write too close to the paper's edge. Please remember that illegible mark-ups may delay publication.

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Query reference	Query	Remarks
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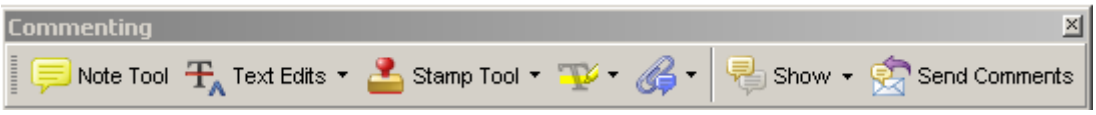
USING E-ANNOTATION TOOLS FOR ELECTRONIC PROOF CORRECTION

Required Software

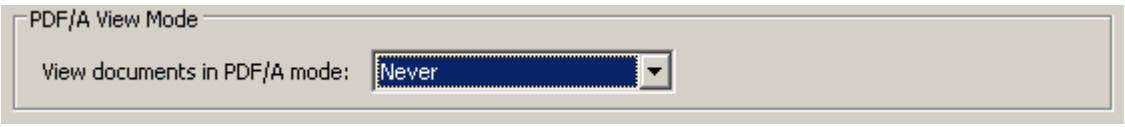
Adobe Acrobat Professional or Acrobat Reader (version 7.0 or above) is required to e-annotate PDFs. Acrobat 8 Reader is a free download: http://www.adobe.com/products/acrobat/readstep2.html

Once you have Acrobat Reader 8 on your PC and open the proof, you will see the Commenting Toolbar (if it does not appear automatically go to Tools>Commenting>Commenting Toolbar). The Commenting Toolbar looks like this:



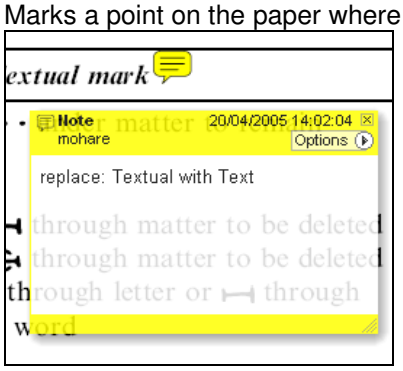
If you experience problems annotating files in Adobe Acrobat Reader 9 then you may need to change a preference setting in order to edit.

In the "Documents" category under "Edit – Preferences", please select the category 'Documents' and change the setting "PDF/A mode:" to "Never".



Note Tool — For making notes at specific points in the text

Marks a point on the paper where a note or question needs to be addressed.

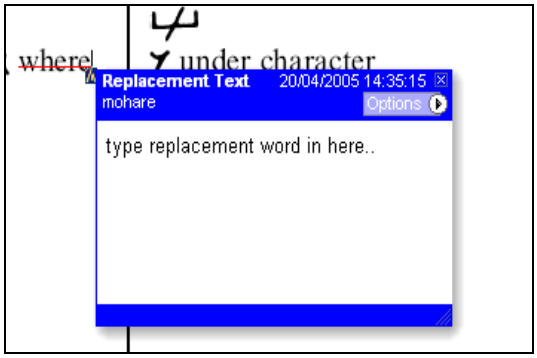


How to use it:

1. Right click into area of either inserted text or relevance to note
2. Select Add Note and a yellow speech bubble symbol and text box will appear
3. Type comment into the text box
4. Click the X in the top right hand corner of the note box to close.

Replacement text tool — For deleting one word/section of text and replacing it

Strikes red line through text and opens up a replacement text box.

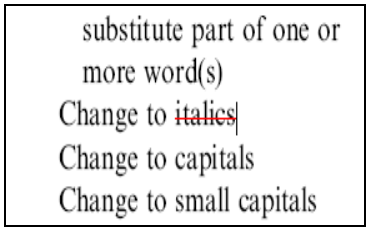


How to use it:

1. Select cursor from toolbar
2. Highlight word or sentence
3. Right click
4. Select Replace Text (Comment) option
5. Type replacement text in blue box
6. Click outside of the blue box to close

Cross out text tool — For deleting text when there is nothing to replace selection

Strikes through text in a red line.



How to use it:

1. Select cursor from toolbar
2. Highlight word or sentence
3. Right click
4. Select Cross Out Text

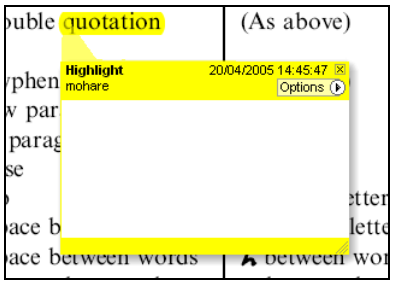
Approved tool — For approving a proof and that no corrections at all are required.

How to use it:

1. Click on the Stamp Tool in the toolbar
2. Select the Approved rubber stamp from the 'standard business' selection
3. Click on the text where you want to rubber stamp to appear (usually first page)

Highlight tool — For highlighting selection that should be changed to bold or italic.

Highlights text in yellow and opens up a text box.

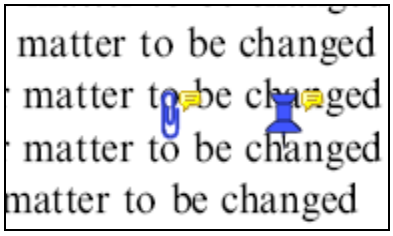


How to use it:

1. Select Highlighter Tool from the commenting toolbar
2. Highlight the desired text
3. Add a note detailing the required change

Attach File Tool — For inserting large amounts of text or replacement figures as a files.

Inserts symbol and speech bubble where a file has been inserted.

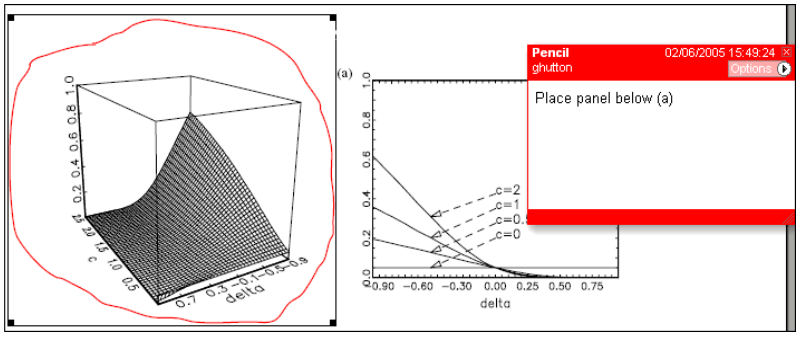


How to use it:

1. Click on paperclip icon in the commenting toolbar
2. Click where you want to insert the attachment
3. Select the saved file from your PC/network
4. Select appearance of icon (paperclip, graph, attachment or tag) and close

Pencil tool — For circling parts of figures or making freeform marks

Creates freeform shapes with a pencil tool. Particularly with graphics within the proof it may be useful to use the Drawing Markups toolbar. These tools allow you to draw circles, lines and comment on these marks.



How to use it:

1. Select Tools > Drawing Markups > Pencil Tool
2. Draw with the cursor
3. Multiple pieces of pencil annotation can be grouped together
4. Once finished, move the cursor over the shape until an arrowhead appears and right click
5. Select Open Pop-Up Note and type in a details of required change
6. Click the X in the top right hand corner of the note box to close.

Help

For further information on how to annotate proofs click on the Help button to activate a list of instructions: