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The role of emotion transition for the perception of social dominance and affiliation

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ABSTRACT

Individuals who show anger are rated as higher in dominance and lower in affiliation, whereas those who express sadness are rated lower in dominance and higher in affiliation. Little is known about situations where people show both expressions in sequence as happens when a first emotional reaction is followed by a second, different one. This question was examined in two studies. Overall, we found that the last emotion shown had a strong impact on perceived behavioural intentions. However, the information about the previously shown emotion was also integrated. The specific mode of integration was dependent on the salience of the change and naive theories about the type of person who changes their emotion in the face of changing events.

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Emotion transition; anger; sadness; social dominance; affiliation

Imagine watching someone who looks angry and whose face slowly turns sad? What are you thinking about this person? In fact, there is little research on the effects of emotion transitions on person perception. Yet, such transitions are a regular part of human emotional reactions. According to the emotions as social information model (see e.g., Van Kleef, 2009, 2010), emotion expressions serve as information to perceivers and help them to make sense of an expresser's understanding of the situation. But what happens when these emotion expressions change within a given emotional episode?

According to appraisal theories of emotion, when an organism detects a relevant change in the environment, it is evaluated as to whether it is pleasant or unpleasant as well as to what degree it is in line with the motivational state of the individual or obstructs the individual's goals or is congruent with relevant norms. This evaluation of an event continues after a first appraisal and is followed by secondary appraisals, which take into account both changes in the perception of the situation and efforts at coping (Lazarus, 1991; Scherer, 1987). In fact, according to more recent conceptualisations of

appraisal theory (Scherer, 2009a, 2009b), appraisals are understood as a recursive process wherein the checking process continues and repeats until the emotion-eliciting event has terminated or been adjusted to. In this sense, Scherer (2009b) points out that the term "emotional state" is actually misleading, as it suggests a static phenomenon rather than a dynamically integrated flow of continuously changing component states. This dynamic aspect refers to the appraisal process as well as the cognitive, physiological, and expressive components it entrains.

Importantly, as the expressive behaviour of a person changes, the inferences drawn from the behaviour should also change. Specifically, people draw inferences about others' behavioural intentions based on their emotional reactions (Hareli & Hess, 2010; Knutson, 1996), which should be dynamically influenced by the changing expressions entrained by successive appraisals.

However, previous research on social perception generally focused uniquely on transitions between neutral and full-blown expressions (Hareli, Shomrat, & Hess, 2009; Knutson, 1996, Study 2; Krumhuber,

Manstead, & Kappas, 2007) not on transitions between different emotions. One exception is a study by Filipowicz, Barsade, and Melwani (2011, Study 3), who instructed a confederate to change their emotional expressions in the course of a negotiation from either happiness to anger or vice versa or show a stable expression throughout. The focus of the study was on the outcome of the negotiation, but participants rated the confederates also on agreeableness as a measure of relational impression. Filipowicz et al. (2011) found that the effect of changing emotions on impressions follows a simple averaging process. In their study, negotiators whose reaction transitioned from happiness to anger or vice versa were rated as intermediate in agreeableness when compared to those who expressed anger and happiness throughout. However, the transition in that study occurred over the course of minutes in an ongoing negotiation—which implies that changes in emotion would be attributed to a change in the situation, not a change in the appraisal of a single event. It can be argued that the process that underlies a change of expression in reaction to one elicitor is not readily comparable to a change of expression when elicitors change.

The present research aims to assess the impact of transitions between anger and sadness on perceived dominance and affiliation. Dominance and affiliation are behavioural dispositions that are of central importance to social beings (Leary, 1957). In hierarchical primate societies, highly dominant alpha individuals can pose a threat insofar as they may claim territory or possessions (e.g., food) from lower status group members (Menzel, 1973, 1974). Hence, the presence of a perceived dominant other should lead to increased vigilance and a preparedness for withdrawal (Coussis-Korbel, 1994). In contrast, affiliation is related to nurturing behaviours and should lead to approach when the other is perceived to be high on this behavioural disposition. Accordingly, it is crucial for social beings to assess the dominance and affiliation of others.

One signal of dominance and affiliation are facial expressions of anger and sadness. Individuals who show anger are rated as higher in dominance and lower in affiliation than those who express sadness (Hareli et al., 2009; Hess, Blairy, & Kleck, 2000; Knutson, 1996). Relatedly, Tiedens (2001) showed that whereas anger is negatively associated with warmth, an integral aspect of affiliation (Leary, 1957), sadness is positively associated with it.

However, little is known about situations where people show both emotions following each other as

suggested by a dynamic view of emotional appraisal. Specifically, both anger and sadness are elicited in situations that are appraised as involving a goal obstruction. The two emotions differ mostly with regard to the person's coping potential (Scherer, 1987, 1999). Thus, the same event may elicit either anger or sadness, depending on the individual's coping potential. This emotion can then change into the other emotion should the evaluation of coping potential change. Such a change may be a result of an active coping attempt (Vandervoort, 2001) or because new information about the situation becomes available, which makes it clear that either a planned coping attempt may not be possible (thereby changing anger into sadness) or reveal a hitherto not obvious coping possibility (thereby changing sadness into anger). Furthermore, the emotions differ with regard to whether a person is to blame for the undesirable situation (i.e., anger) or not (i.e., sadness) (Lazarus, 1991). Reconsideration of another's responsibility for a situation or information that shifts responsibility—for example, from the person to the situation—is likely to change the reaction to sadness. Such a transition should then influence the perceived dominance and affiliation of the person, but can also have an effect on the perceived intensity of the emotion.

Perceptions of emotion intensity, dominance and affiliation

The findings by Filipowicz et al. (2011) suggest that person perception in the context of changing emotion follows a simple averaging process. Negotiators whose reaction transitioned over the course of an interaction from happiness to anger or vice versa (from anger to happiness) were rated as intermediate in positivity when compared to those who expressed anger and happiness throughout. This may also be true for the effects of the much faster transitions of expressions in the course of exposure to the same specific eliciting situation if its appraisal changes. Thus, one possible effect of transitions between emotions is an averaging effect. In the present context, a transition between anger and sadness would then result in an intermediate level of dominance and affiliation, when compared to stable expressions throughout (Hypothesis 1).

Yet, the research mentioned above included expressions that were shown over a rather long period of time and hence may not be representative

of the expressive transitions resulting from the faster dynamic assessment of events described above. Thus, alternatively, a change from one emotion to another may affect the inferences drawn from the expression in ways similar to the perception of emotion intensity. Specifically, a dynamic expression that changes from a neutral expression to the apex of a given emotion is perceived as more intense than the end state of the same expression shown in isolation (Biele & Grabowska, 2006). This can be seen as a contrast effect (Hypothesis 2). In the present context, anger transforming to sadness would lead to a higher level of perceived affiliation than steady sadness. Likewise, sadness transforming into anger would lead to higher degrees of perceived dominance. Conversely, person perception may be determined by the end state of the expression (Hypothesis 3). That is, regardless of the question of whether the reaction included a transition between emotions or not, whatever reaction was perceived as the end state will dominate the perception of the expresser.

Finally, it may also be that anger dominates person perception (Hypothesis 4). Emotions are social signals (Hareli & Hess, 2011; Parkinson, Fischer, & Manstead, 2005; Van Kleef, 2009) and they serve multiple purposes in social interaction. Anger is not only associated with dominance but also often perceived as a sign of aggression (Averill, 1982; Berkowitz, 1999; Hareli & Hess, 2010) or at least as a sign of aggressive potential (Frijda, Kuipers, & ter Shure, 1989). As such, the social signals sent by anger may demand more immediate action and have a greater potential to be perceived as self-relevant by the observer. Thus, we might expect anger to be a signal that carries a special weight. This was one argument behind research on the face in the crowd effect for anger (Hansen & Hansen, 1988). In this case, we would predict that any expression that contains anger should be rated as more dominant and less affiliative than stable sadness expressions. Thus, overall, we tested four alternative hypotheses regarding the way transitions between anger and sadness may affect social perception of dominance and affiliation. These predictions are mutually exclusive if they apply across both types of inferences and both emotions since they are expected to lead each to a different pattern of results. However, it is possible that the process is not the same for dominance versus affiliation ratings or for the influence of anger versus sadness. In this case, more than one prediction could be supported.

Overview

To assess these four hypotheses, we conducted two studies. The first used a method we call “frozen dynamism” in which participants saw two expressions as still photos, which were purportedly taken from the beginning and the end of a single emotional episode. The study followed a 2 (End Expression) by 2 (Transition) design, such that participants saw either sadness followed by sadness, anger followed by anger, sadness followed by anger, and anger followed by sadness in a within-subjects design.

No information about the context in which these expressions occurred was given. The goal was to simply present the notion of a changed expression. As such this approach simplified the presentation but at the cost of a more ecologically valid stimulus. These were used in Study 2, where participants saw videos with actual dynamic transitions, following the same design.

Study 1

Participants

A total of 94 MBA students (62 men) at the university of Haifa with a mean age of 39 years ($SD = 6.74$) participated for extra course credit.

Procedure

Participants arrived at the laboratory in groups of up to five and, after informed consent was obtained, were seated in front of computer screens in separate compartments. The experimenter explained that the study is about person perception and that they are about to see a series of sets of two photographs showing the same person, which are excerpts from a video showing how these people reacted at two consecutive points in time to a given situation, which was not specified further, and that the duration of the presentation reflects the duration of each expression. Participants also received the information that on some occasions the reactions are different across the two points in time and sometimes they are the same. Thus, we employed a methodology that can be considered as “frozen dynamism”. This enabled us to focus mainly on the transition between emotions while controlling other aspects of the expression.

Stimulus material

Photographs of four men and four women expressing anger and sadness were taken from the Montreal Set

of Facial Displays of Emotion (Beaupré & Hess, 2002). Relative duration of each expression was also varied, such that for half of the participants the first photo was shown for a second and the second one for five seconds, and for the other half of participants the duration was reversed. Thus, each participant saw eight sets of expressions presented in a random order with the restriction that for each set a different expresser was used. To control for the effect of the expresser, different participants saw a given expresser in a different condition. The photos appeared on the upper part of the screen. To remind participants of the order of the expressions, under the first photo appeared the inscription “the expression at the start” and under the second photo appeared the inscription “the expression later”. Once the time for the second photo elapsed, the photograph disappeared and rating scales appeared on the screen.

Dependent measures

Using single item scales, participants were asked to rate the perceived intensity of anger and sadness for each trial, as well as the perceived dominance, submissiveness, competence, perceived control over the situation, and sociability (sociability was used as the Hebrew language does not have a proper word for affiliation). Since ratings of dominance, submissiveness, control, and competence were highly correlated, a composite variable combining these ratings was computed (across conditions, $M = .72$, range: $\alpha = .60$ to $\alpha = .79$). We refer to this composite variable as dominance. In addition, the degree to which the reaction seemed to be caused by the situation and the individual's character respectively was assessed. For all ratings we used seven-point Likert scales anchored with 0—not at all and 6—to a large extent.

Results

Manipulation checks

Anger

A 2 (End Emotion: anger versus sadness) \times 2 (Transition: yes, no) ANOVA on the anger ratings, revealed main effects of End Emotion, $F(1,93) = 224.02$, $p < .001$, $\eta_p^2 = .71$, and Transition, $F(1,93) = 44.85$, $p < .001$, $\eta_p^2 = .33$, as well as a significant End Emotion by Transition interaction, $F(1,93) = 13.54$, $p < .001$, $\eta_p^2 = .13$. Expressions that ended in anger were rated as significantly more angry than those

that ended in sadness. Also, when anger had preceded sadness, the expression was rated as significantly more angry than when anger had not been shown at all. Expressions that changed from sadness to anger were rated as even more angry than when anger was shown throughout, suggesting a contrast effect. That is, participants did not only rate the end emotion, but integrated the change in expression into their ratings.

Sadness

Significant main effects of End Emotion, $F(1,93) = 153.28$, $p < .001$, $\eta_p^2 = .62$, and Transition, $F(1,93) = 22.68$, $p < .001$, $\eta_p^2 = .20$, emerged. The interaction effect was not significant, $F(1,93) = 3.27$, $p = .074$, $\eta_p^2 = .03$. Expressions that ended in sadness were rated as sadder than those that ended in anger and expressions that changed were rated as more intensely sad than those that did not, replicating the contrast effect observed for anger. Means and standard deviations are given in Table 1.

Hypotheses testing

A series of End Emotion (anger versus sadness) \times Transition (yes, no) repeated measures analyses of variance were conducted on all ratings. Initial analyses showed that the duration of the expressions did not moderate the effects of End Emotion and Transition (p 's $> .25$). Therefore this factor was dropped from further analysis. The means and standard deviations are given in Table 1.

Dominance and sociability

Dominance

A significant main effect of End Emotion, $F(1,93) = 127.37$, $p < .001$, $\eta_p^2 = .58$, as well as a significant End Emotion by Transition interaction, $F(1,93) = 4.16$, $p = .044$, $\eta_p^2 = .04$, emerged. The main effect of Transition was not significant, $F(1,93) = 1.63$, $p = .286$, $\eta_p^2 = .01$. Expressers who showed anger throughout were rated as significantly more dominant than those who showed first sadness and then anger. When sadness was the end emotion, perceived dominance did not differ between expressers who showed sadness throughout and those who showed anger first. Thus, showing sadness at any time negatively affected perceived dominance, whereas showing anger first did not increase dominance ratings for those who ended up showing sadness.

Table 1. Means and standard deviations for Study 1.

Dependent variable		End Emotion			
		Anger		Sadness	
		M	SD	M	SD
Anger	Stable	3.86 _a	1.39	1.43 _b	1.09
	Transition	2.32 _c	1.10	2.81 _d	1.66
Sadness	Stable	1.95 _a	1.12	3.82 _c	1.56
	Transition	2.71 _b	1.33	4.10 _c	1.20
Dominance	Stable	2.59 _a	.71	1.61 _b	.75
	Transition	2.37 _c	.75	1.68 _b	.75
Affiliation/Sociability	Stable	1.56 _a	.92	2.11 _b	.96
	Transition	1.79 _a	.88	2.26 _b	.93
Characterological attribution	Stable	2.97 _a	1.17	2.93 _a	1.15
	Transition	2.93 _a	1.04	2.79 _a	1.09
Situational attribution	Stable	2.59 _a	1.39	2.63 _a	1.46
	Transition	3.48 _b	.89	3.45 _b	.99

Notes: Subscripts based on Fisher LSD tests at $p < .05$. Higher numbers represent higher ratings. Within variable, numbers with different subscripts differ at $p < .05$.

Sociability

The main effects of End Emotion, $F(1,93) = 33.33$, $p < .001$, $\eta_p^2 = .26$, and Transition, $F(1,93) = 5.18$, $p = .025$, $\eta_p^2 = .05$, emerged significantly. The End Emotion by Transition interaction was not significant, $F(1,93) = 0.29$, $p = .589$, $\eta_p^2 = .00$. When sadness was the end emotion, the expresser was rated as more sociable than when the end emotion was anger, that is, the end emotion dominated the ratings. In addition, the expresser was rated as more sociable when the expression had changed than when it remained stable throughout, suggesting that the fact that an expression changes is suggestive of a more affiliative person.

Attributions

Emotion was caused by the situation

Only the main effect of Transition was significant, $F(1,93) = 38.12$, $p < .001$, $\eta_p^2 = .29$, the main effect of End Emotion, $F(1,93) = .01$, $p = .951$, $\eta_p^2 = .00$, and the End Emotion by Transition interaction, $F(1,93) = .14$, $p = .713$, $\eta_p^2 = .00$, were not significant. The emotion of expressers whose emotion changed was attributed to the situation to a larger extent than the emotion of expressers who showed the same emotion throughout. That is, participants seemed to consider a change in the situation to be the cause for the change in emotion, rather than a coping effort of the expresser.

Emotion was caused by the character of the expresser

The main effects of End Emotion, $F(1,93) = 1.07$, $p = .303$, $\eta_p^2 = .01$, of Transition, $F(1,93) = .91$, $p = .342$, $\eta_p^2 = .01$, as well as the End Emotion by Transition

interaction, $F(1,93) = .30$, $p = .587$, $\eta_p^2 = .00$, were all non-significant.

Discussion

Across dependent variables, we found that end emotion had a strong effect on ratings of behavioural intentions, emotions, and attributions. Specifically, expressions that ended in anger were rated as more dominant and less affiliative than those that ended in sadness. They were also rated as more angry and less sad. This effect is in line with our third hypothesis, which predicts that the end state dominates ratings.

However, transitions also had an effect such that the end state effect was moderated by an effect of transition. The exact form of this moderation differed between dependent measures. For the emotion ratings, expressions that changed were rated more intensely than those that did not and the same applied to sociability ratings, where individuals who changed their expression in either direction were rated as more sociable than when the same end emotion was shown throughout. This corresponds to a contrast effect (Hypothesis 2). Expressions that changed were also rated as more situation dependent than expressions that were stable. That is, participants considered the change in expression as more likely caused by the situation than the stable one. This matches the findings by Filipowicz et al. (2011), who also found that transitions between emotions were attributed to the situation.

By contrast, with regard to dominance, a slightly different pattern emerged. Having shown sadness at any stage reduced dominance ratings compared to a

stable anger expression. Expressions of anger along sadness regardless of the order in which these emotions appear did not increase perceived dominance. That is, showing a “weak” emotion (i.e., an emotion associated with low dominance) at any stage reduced perceived dominance even if at some stage the expresser showed a “strong” emotion (i.e., an emotion associated with high dominance). This suggests that for dominance any sign of weakness has a greater impact on the impression than a sign of strength. Overall for dominance, transitions led to an averaging effect, consistent with our first hypothesis.

These findings suggest that the signal value of sadness for dominance is in some ways stronger than the signal value of anger, in that sadness can negatively affect dominance ratings even if the end emotion is anger, whereas the converse was not the case. For sociability, change in itself seemed to be a signal that a person is more sociable. Given that participants attributed changes in expression to the situation, this may suggest that it is a characteristic of a sociable person to be sensitive to the situation and hence adapt emotionally.

Overall, even though the participants’ conclusions about the behavioural intentions of expresser were heavily based on the end emotion, this was more so the case for dominance than for sociability, for which change alone seemed to be an indicator of affiliative intent. The findings also suggest that participants integrate the temporal sequence of emotions into their perception of a person’s dominance. However, in the latter case, it was not as predicted in hypothesis four, the presence of anger, which determined high dominance, but rather the presence of sadness, which determined low dominance.

Study 2

Even though the results of Study 1 clearly suggest that the social signal value of an expression is impacted by expression changes and does not depend solely on the final emotion shown, the study suffered from several disadvantages. First, we showed still photos of apex expressions in sequence, which is not how changing expressions would normally develop. Also, the photos we chose were black and white, further reducing ecological validity. More importantly, the expressions were shown without context. Yet,

recently, the importance of studying emotional reactions embedded into context has been recognised (Barrett, Mesquita, & Gendron, 2011; Hess & Hareli, 2014). More importantly, we wished to ensure that participants perceive the transforming expressions as elicited in response to a specific and unchanging event rather than caused by a change of events. Hence, for Study 2, we decided to use morphing to create smooth transitions between the emotion expressions and showed participants photos with the supposed emotion-eliciting event. The photos were chosen from the International Affective Picture System (IAPS, Lang, Bradley, & Cuthbert, 1990) and had been validated to elicit both anger and sadness (Mikels et al., 2005). Finally, in Study 1, affiliation had only been assessed via a single item. We therefore expanded the list of dependent variables to include a multiple item scale for affiliation as well. To keep the duration of the experiment below 20 minutes, we decided to collect dominance and affiliation ratings from separate groups of participants.

Method

Participants

A total of 220 participants (88 men) with a mean age of 39 years ($SD = 11$) recruited via Amazon Mechanical Turk completed the study and correctly answered control questions probing for their understanding of the instructions. Participants received \$1 for their participation. Of these participants, 111 (42 men) completed the affiliation version of the scales and 109 (46 men) the dominance version.

Stimulus material

Photos depicting expressions of sadness and anger from four different men and women were taken from the Amsterdam Dynamic Facial Expression Set (van der Schalk, Hawk, Fischer, & Doosje, 2011). The eight sets of photos were used to create 16 morphed and edited videos for the study. Eight photos from the IAPS (Lang et al., 1990) served as the supposed emotion-eliciting stimuli. These photos¹ were chosen based on normative data from a study on the IAPS stimulus set (Mikels et al., 2005). We chose photos that elicited relatively comparable degrees of sadness and anger. Thus, anger and

¹2710, 3180, 3500, 6212, 6313, 9180, 9560, 9810.

sadness should be equally plausible reactions to the stimuli. The photos were counterbalanced such that across participants the same image occurred with all sequences of expressions of emotions.

Videos were edited using Camtasia Studio 8 (Tech-Smith, www.techsmith.com). Each video showed first one of the emotion-eliciting pictures for five seconds. Then the photo disappeared and the video of the target person starting with a neutral expression was shown. Five hundred milliseconds after the appearance of the target person, the stimulus photo appeared again on the upper left part of the screen in a small rectangle and the target person's expression changed to sadness or anger. The expression was then either maintained for five seconds, or changed after 2.5 seconds to the respective other emotion. The video then disappeared and the rating scales appeared. [Figure 1](#) shows the trial sequence for the emotion transition condition.

This resulted in a 2 End Emotion (sadness versus anger) \times 2 Transition (yes, no) within-subjects design. Each participant saw the eight videos in random order with the restriction that for each condition a different expresser was used. Expressers and condition were counterbalanced across participants.

Dependent measures

Participants were asked to rate the perceived intensity of anger and sadness for each trial, as well as the perceived authenticity of the stimuli. The latter was used to assess whether the morphed expressions seemed to be plausible reactions to the emotion-eliciting photos.²

To assess dominance, half the participants were asked to rate the expressions on perceived dominance, submissiveness, competence, perceived control over the situation, and perceived intelligence (alphas for the combined scale ranged from .59 to .70, $M = .65$). The other half of the participants rated the items on sociability, as well as on how caring and sensitive the person seemed, and how emotionally intelligent and appropriate their reactions were (alphas for the combined scale ranged from .78 to .92, $M = .88$). All ratings were done on seven-point

Likert scales anchored with 0—not at all and 6—to a large extent.

Results

Manipulation checks

A 2 End Emotion (sadness, anger) \times 2 Transition (stable versus transition) \times 2 Rating Condition (dominance versus sociability) analysis of variance with End Emotion and Transition as within and Rating Condition as between-subjects factor was conducted on authenticity as well as the emotion ratings. The means and standard deviations are given in [Table 2](#).

Authenticity

No significant main effect of End Emotion, $F(1219) = 1.98$, $p = .161$, $\eta_p^2 = .01$, or Transition, $F(1219) = 2.68$, $p = .103$, $\eta_p^2 = .01$, nor a significant interaction emerged, $F(1219) = 2.01$, $p = .157$, $\eta_p^2 = .01$. The overall mean across conditions was $M = 4.00$ ($SD = 4.09$), suggesting that all expressions were perceived as authentic reactions to the stimuli.

Anger

Significant main effects of End Emotion, $F(1218) = 844.98$, $p < .001$, $\eta_p^2 = .80$, and Transition, $F(1218) = 751.52$, $p < .001$, $\eta_p^2 = .78$, emerged as well as a significant End Emotion by Transition interaction, $F(1218) = 437.79$, $p < .001$, $\eta_p^2 = .67$. Neither the main effect of Rating Condition nor any interactions involving Rating Condition were significant (p 's $> .15$). As in Study 1, expressions that ended in anger were rated as significantly more angry than those that ended in sadness. Also, when anger had preceded sadness, the expression was rated as significantly more angry than when anger had not been shown at all. However in Study 2, no contrast effect emerged for expressions that changed from sadness to anger, rather these were rated as slightly lower in anger than stable anger expressions.

Sadness

Significant main effects of End Emotion, $F(1218) = 543.99$, $p < .001$, $\eta_p^2 = .71$, and Transition, $F(1218) = 270.02$, $p < .001$, $\eta_p^2 = .55$, as well as a significant End

²As an additional measure of authenticity, participants were asked to rate the degree to which the emotional reaction seemed controlled. A significant three-way interaction between end emotion, transition, and rating condition emerged, such that to varying degrees across conditions, participants in the dominance rating condition rated all expressions as higher in control than participants in the affiliation rating condition, suggesting a priming effect of rating condition.

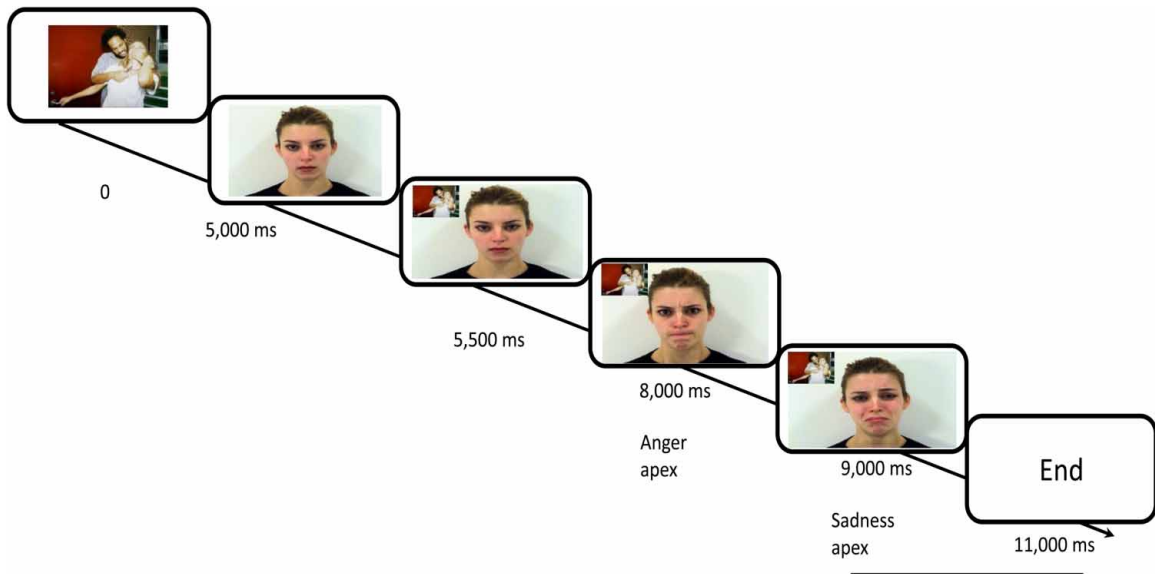


Figure 1. Trial sequence in the emotion transition condition.

Emotion by Transition interaction, $F(1218) = 590.01$, $p < .001$, $\eta_p^2 = .73$, emerged. Neither the main effect of Rating Condition nor any interactions involving Rating Condition were significant (p 's $> .14$). The pattern of means did not fully correspond to the results from Study 1. Thus, stable sad expressions were rated as more sad than stable anger expressions; however, when anger transitioned into sadness or vice versa, the expressions were rated as more sad than the stable anger expression, but not different from each other. Thus, in Study 2, the emotion ratings were more in line with an averaging effect. This may be due to the fact that in Study 1, transitions were more salient than in Study 2,

where faces slowly transitioned from one expression to the other.

Hypothesis testing

Dominance and affiliation

A 2 End Emotion (anger, sadness) \times 2 Transition (yes, no) analysis of variance was conducted on the two composite scales for dominance and affiliation.

Dominance

A significant main effect of End Emotion, $F(1108) = 74.16$, $p < .001$, $\eta_p^2 = .41$, as well as a significant End Emotion by

Table 2. Means and standard deviations for Study 2.

Dependent variable		Study 2a: Dominance				Study 2b: Affiliation			
		End Emotion				End Emotion			
		Anger		Sadness		Anger		Sadness	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Anger	Stable	4.79 _a	1.08	1.41 _c	1.31	4.69 _a	1.10	1.26 _c	1.24
	Transition	4.74 _{ab}	.84	4.56 _b	1.02	4.62 _{ab}	.92	4.39 _b	1.13
Sadness	Stable	1.60 _a	1.47	5.00 _c	.94	1.67 _a	1.33	4.93 _c	.93
	Transition	4.55 _b	1.03	4.59 _b	1.04	4.36 _b	.96	4.37 _b	1.05
Authenticity	Stable	4.05 _a	1.34	4.11 _a	1.38	4.06 _a	1.18	3.96 _a	1.31
	Transition	3.85 _a	1.46	4.09 _a	1.40	3.89 _a	1.32	4.01 _a	1.37
Dominance	Stable	3.60 _a	.70	2.90 _b	.76				
	Transition	3.39 _c	.73	3.26 _d	.70				
Affiliation/Sociability	Stable					4.12 _a	.95	4.38 _b	.82
	Transition					4.31 _b	.93	4.42 _b	.88

Notes: Subscripts based on Fisher LSD tests at $p < .05$. Higher numbers represent higher ratings. Within variable and within Study, numbers with different subscripts differ at $p < .05$. Ratings of dominance and affiliation were made by different participants.

Transition interaction, $F(1108) = 36.31, p < .001, \eta_p^2 = .25$, emerged. The main effect of Transition was not significant, $F(1108) = 2.94, p = .090, \eta_p^2 = .03$. As in Study 1, expressers who showed anger throughout were rated as significantly more dominant than those who showed first sadness and then anger. However, when sadness was the end emotion, perceived dominance was higher for expressers who showed anger first than for those who showed sadness throughout, but the former were still rated as significantly less dominant expressers than the ones who had shown sadness first followed by anger. Thus, as in Study 1, showing sadness at any time negatively affected perceived dominance, however, in Study 2, unlike Study 1, showing anger first increased dominance ratings for those who ended up showing sadness. That is, in this study, both transitions had an effect on dominance ratings, a finding more in line with the notion of averaging (our first hypothesis) as found by Filipowicz et al. (2011) for agreeableness.

Affiliation

The main effects of End Emotion, $F(1110) = 7.25, p = .008, \eta_p^2 = .06$, and Transition, $F(1110) = 3.84, p = .053, \eta_p^2 = .03$, emerged significantly. The End Emotion by Transition interaction was not significant, $F(1110) = 1.81, p = .181, \eta_p^2 = .02$. As for sociability in Study 1, when sadness was the end emotion, the expresser was rated as more affiliative than when the end emotion was anger. Also, the expresser was rated as more affiliative when the expression had changed than when it remained stable throughout. As such, the results for the composite affiliation scale closely mirror the ratings for sociability in Study 1.

Discussion

With regard to ratings of behavioural intentions, the results for Study 2 closely replicated the findings from Study 1. The pattern of results for affiliation in Study 2 closely matched the pattern for the one-item sociability measure in Study 1, which was in line with Hypothesis 2. For dominance ratings, the pattern for stable anger and sadness, as well as for anger preceded by sadness matched the pattern for Study 1, such that the end state dominated in line with Hypothesis 3. However, in contrast to Study 1, expressers who showed anger at any time were rated as more dominant than those who never showed anger, which suggests an averaging effect (Hypothesis 1).

A slightly different pattern emerged with regard to the emotion ratings. In Study 1, emotion ratings depended on the end emotion alone (Hypothesis 3), thus expressions that ended in anger were rated as high in anger and low in sadness, and vice versa for expressions that ended in sadness. By contrast, in Study 2, participants integrated the ratings for expressions that transitioned such that stable expressions of anger were rated as high in anger and low in sadness, stable expressions of sadness were rated as high in sadness and low in anger, whereas both transitioning expressions were rated as equally high in both emotions (Hypothesis 1). That is, participants rated these expressions as mixed, suggesting a more integrated perception of expressions that transitioned smoothly as opposed to the stills used in the frozen dynamism condition.

General discussion

Emotions are a dynamic reaction based on how an individual understands an event (Scherer, 2009a, 2009b) and serve others as a source of information about the emoter (Hareli & Hess, 2010; Van Kleef, 2009). The present study was based on the prediction that these impressions regarding the emoter were not only determined by the end emotions shown, but also by their dynamic change. In two studies, we could support this general prediction.

Specifically, the results of the ecologically more valid manipulation of the emotion transition closely matched the findings from Study 1, which used a frozen dynamism approach. In both cases, the end emotion heavily influenced the perception of both dominance and affiliation, but the mere fact that a transition occurred was a marker for increased sociability. As in Study 1, changes in expression were attributed to the situation more than stable expressions; it could be speculated that a person whose emotions adapt to the situation is perceived as more sociable. The fact that person perception was more strongly determined by the presence or absence of anger rather than change per se makes sense insofar as angry others are to some degree threatening (Averill, 1982) but in any case demand more attention.

Emotion ratings however, were affected by the difference between stimuli. On the one hand, it is important to note that in fact different stimuli were used, which may explain why stable expressions of the emotions were rated as more intensely angry and sad respectively in Study 2. However, differences

were also found for the comparison between stable and transitioning expressions within studies. In particular, in Study 1, a contrast effect emerged such that transitioning expressions were rated more intensely than stable ones with the same end emotion, this was not the case in Study 2. This contrast effect may have occurred because the change was made more salient in the frozen dynamism condition than when a smooth transition was shown. In the latter case, this resulted in a more mixed perception of the transitioning emotions, but these perceived mixed emotions did not translate into person perception.

We had predicted four possible patterns of how information from transitioning facial expressions may be integrated into person perception. Hypothesis 1, based on Filipowicz et al.'s (2011) findings for perceptions of agreeableness, predicted a pattern where perceptions based on transitioning emotions did not differ as a function of end emotion and were rated as intermediate between the two stable emotion expressions. The closest to this would be the findings for dominance for Study 2, but here too the end emotion biased the results such that the two transitions were not judged as equally dominant. An alternate prediction was that end emotion drives the effect (Hypothesis 3). This was largely the case for both dominance and affiliation in both studies. However, the presence of effects of transition and an interaction effect complicated the picture. Thus, in both studies the mere fact that a transition occurred seemed to be interpreted as a marker of affiliation—a contrast effect in line with Hypothesis 2—and the presence and absence of anger very heavily weighted ratings of dominance which was our fourth alternate prediction.

The inference of personality characteristics from emotion expression can be explained by a process that Hareli and Hess (2010) refer to as reversed engineering. Specifically, observers can reconstruct appraisals as they apply to a situation (Robinson & Clore, 2002). This means that observers can reconstruct the relationship between the person and the event based on the emotion expressed. For example, the reversed engineering model by Hareli and Hess states that a person who sees an angry other will know that this person encountered an event that obstructed the person's goals but felt competent enough to change the situation to their advantage—even if the observer does not know anything else about the emoter and the situation in which the emotion occurred (Hareli & Hess, 2010), by contrast

if the person shows sadness, this suggests that they do not feel able to do so.

From this perspective, the strong effect of the end emotion is explained by its stronger proximal relevance for the person's dominance and affiliation at this very moment. However, the context of an event also provides information and this information is interpreted in light of a person's knowledge about the world or naive emotion theory (Hess & Hareli, 2014). In the present case, for example, the fact that an emotion transitioned into another seemed to suggest to participants that the expresser was more sociable. Hence even though a person who showed sadness throughout was rated as more affiliative than one whose expression ended in anger, a sadness expression which had transitioned from anger was rated as even more so. That is, there was an additive effect of transition for the perception of affiliation.

Despite the fact that we were able to show that transitions between expressions of emotions have a role in inferences drawn from these expressions and our results imply that naive understanding of the appraisals responsible for these expressions drive these effects, direct evidence for this was not provided. Future research should focus more directly on assessing perceivers' understanding of how the expressers appraised the situation and the extent to which this understanding is responsible for the effects of the expressions on the inferences drawn from them. An additional limitation of the present research relates to some discrepancy between the results of our studies. One reason for this may be that the design of Study 1 sensitised participants to the peaks of each expression at the expense of the transition between emotions as such. This made the difference between the states more apparent. This suggests the possibility that the rate of transition as well may play a significant role in the perceptions in question. Future research should examine this possibility.

Conclusions

In all, these findings suggest that observers do not base person perception on one element alone. Even though the reverse engineering view predicts that the last shown emotion is perceived as most relevant for the behavioural intentions by another person, the information about the previously shown behaviour was integrated. The specific mode of integration seems to depend on (a) the salience of the change and (b) naive theories about the type of

person who changes their emotion in the face of changing events.

Disclosure statement

No potential conflict of interest was reported by the authors.

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