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Perception of emotional climate in a revolution: Test of a multistage theory of revolution in the Tunisian context

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Participation in social movements and collective action depends upon people's capacity to perceive their societal context. We examined this question in the context of Arab Spring revolutions. In a classic theory of revolution highlighting the role of collective emotions, Brinton (1938) claimed that revolutions, far from chaos, proceed in an orderly sequence involving four stages: euphoria, degradation, terror, and restoration. The emotional climate (EC) as perceived by ordinary Tunisian citizens (2,699 women and 3,816 men) was measured during the 4 years of the Tunisian revolution. A quadratic pattern of perceived EC measures over time provided strong support to Brinton's model. In addition, three different analyses suggested the presence of four distinct stages in the evolution of perceived EC. Third, the socio-political developments in Tunisia during the four stages proved entirely consistent with both Brinton's theoretical model and the perceived EC indicators. Finally, social identification proved closely related to the temporal evolution of positive EC scores. In sum, data from this study not only lend support to the views put forth in an heretofore untested classic theory of revolution but also demonstrate that psychosocial measurements can validly monitor a major process of socio-political transformation.

Since decades, social psychologists investigate social movements and collective action (for reviews, Drury & Reicher, 2009; Klandermans, 2004; van Stekelenburg & Klandermans, 2009; Van Zomeren, Postmes, & Spears, 2008). People's participation in demonstrations, protests, strikes, blockades, riots, and the like is at the heart of several empirical investigations. What is it that mobilizes people to engage in collective action? A critical issue rests on the distinction between normative and non-normative actions (Becker & Tausch, 2015; Wright, Taylor, & Moghaddam, 1990). Political participation and peaceful protests illustrate normative actions because such actions conform to the norms of existing social systems. In contrast, violence and terrorism represent non-normative actions because they violate these rules. Forms of collective action studied so far in social psychology mainly concerned temporary ventures the success or failure of which was assessed over a short period of time. To our knowledge, with only one exception (McGarty, Thomas, Lala, Smith, & Bliuc, 2014), social psychology has not yet tackled the less frequent, long-term, radical collective movements involved in a revolutionary process. Focusing on the Tunisian context, the present contribution aimed to begin and unravel the psychological features of such significant social events as national revolutions.

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Fidel Castro (1961) once stated, 'A revolution is not a bed of roses, a revolution is a struggle to the death between the future and the past'. More pragmatically, Samuel Huntington (1968) defined revolution as 'rapid, fundamental, and violent domestic changes in the dominant values and myths of a society, in its political institutions, social structures, leadership and government activity and policies' (p. 264). Periods corresponding to this definition involve struggle without mercy for power and sovereignty. Theories of revolutions abound in sociology (e.g., Foran, 1993; Goodwin, 2001), political sciences (e.g., Goldstone, 1980, 2001), history (e.g., Kroeber, 1996), and anthropology (e.g., Thomassen, 2012). From a social psychology perspective, a revolution exposes citizens to long periods of emotional turmoil, with alternations of violent riots and violent repression.

Stages of revolutions

In the 1920s and 1930s, historians and sociologists identified patterns of events that were common to four major political revolutions, that is, the English Revolution of 1640, the American Revolution of 1776, the French Revolution of 1789, and the Russian Revolution of 1917 (Brinton, 1938/1965; Edwards, 1927; Pettee, 1938). Their observations on the shared sequence of events in these revolutions have been so commonly borne out that they appear to be law-like empirical generalizations (Goldstone, 1982). Within this perspective, Brinton's *Anatomy of Revolution* stands out as 'one of the most widely read scholarly accounts of revolution' (Knutsen & Bailey, 1989, p. 241).

According to Brinton's analysis, four successive stages develop in a revolution process (see Table 1). The first stage, labelled *opposition between the moderates and the radicals*, involves initially a short period of extreme euphoria, hope, and joy, followed by an alternation of enthusiasm and disappointment and by a growing feeling of frustration. In the second stage, or *crisis,* radicals supplant moderates. The enthusiasm of the masses declines rapidly giving way to anxiety and negative emotions. *Terror* reigns in the third stage, as radicals impose their rules forcefully. Fear and anxiety then dominate the social atmosphere. Finally, a revolution concludes with *convalescence*. Terror comes to an end, giving way to emotional relief in the population with reduction of negative emotions and moderate return of optimism and positive emotions.

Do citizens perceive the dynamic of a national context?

According to political scientist Goldstone (2003), Brinton's account provides a fairly comprehensive picture of the dynamics of the revolutionary process: 'Not only did this schema fit rather well the cases for which it was developed; it also fit remarkably well cases that arose decades later...' (p. 56). After such work, revolution is no more viewed as a chaotic period, but rather as a process or a multistage cycle (Knutsen & Bailey, 1989). Later, Davies (1962) also described revolution as resulting from the interplay between periods of raising expectations and periods of frustration. 'To be predictive, he wrote, my notion requires *the assessment of the state of mind* – or more precisely, *the mood – of a people*' (p. 18, italics added). Interestingly, this concern expressed years ago by a theorist of revolution resonates with major concerns formulated by current theorists of social movements. Thus, van Stekelenburg and Klandermans (2009) ended their comprehensive review of the social psychology of contention by stressing that little social–psychological research focused on the subjective experience of more objective macrolevel factors (Klandermans, 1997). They stated that the dynamics of participation was recently

Table 1. A summary of Brinton (1938/1965) prototypical stages of a revolution

Stage 1 – Opposition between the moderates and the radicals
- The collapse of the old regime is followed by a brief honeymoon period in which all revolutionaries feel united
- Euphoria rapidly leaves the place to disagreements about political action opposing conservatives, radicals, and moderates
- The moderates seize the reins of state initially. They do not believe in the big slogans of the movement. They are for compromise and comfort and struggle to find a middle road
- The radicals quickly oppose the hesitant government of the moderate. They want rapid and widespread changes
- The moderates lose their credit in the eyes of many who in the wake of the movement express high expectations and despise comfort

Stage 2 – Crisis
- Aided by a fanatical devotion, the mass-mobilizing organizations of the radicals succeed in supplanting the moderates.
- Where the moderates are weak, the radicals are strong and very sure to be superior
- Led by a belief in the Absolute, they now hold the monopoly of the revolutionary ideals
- Without regard for injured human dispositions, they impose major societal changes
- Large numbers of people drop out of active politics, incapable of the mental and physical strain of being a devoted extremist

Stage 3 – Reign of terror
- Animated by a religious fervour, radicals want to bring heaven on earth and their rule thus puts a heavy strain on outsiders
- Unable to carry their ordinary brothers along with them, they progressively make use of terror. Constant threat and the omnipresence of the government dominate social life
- A special sort of police appears. Irregular acts of violence are perpetrated. Uncertainty and fear develop. Nobody can tell when the lightning is going to strike
- For a short period, the radicals can be as extreme as they like. No one dare challenging them
- Yet, their government is poorly efficient. Their administrators are usually inexperienced, petty incompetent fanatics who have to work with a distrustful or hostile population

Stage 4 – Convalescence
- The machinery of terror jams
- Economic crisis develops due to a shortage of the necessities of life. Capitals get frightened and begin to leave the country. Peasants' difficulties lessen agricultural production. Class struggles appear
- Most people cannot long stand the strain of prolonged effort to live in accordance with very high ideals
- A tyrant, or unconstitutional ruler, is brought to power. When laws, customs, habits, and beliefs tie men together insufficiently, force must be used to remedy. Radicals are imprisoned or executed
- The moderates return to power and invest their efforts in the restoration of a stable status quo and in the moderate pursuit of progress
- Ordinary people can return to their role of spectator of social life
- The new governing classes, who have survived a rigorous selection, generally do a good job in getting institutions, laws, routines once more working

demonstrated to be a function of characteristics of the national contexts in which people are embedded (Koopmans & Statham, 2000). The authors concluded that a key point is that people still have to perceive characteristics of this context and translate it to their individual situation (Roggeband, 2002, 2004).

Do people perceive the variations of a national context of which they are a part? Periods of revolution with their multistage cycles of consequential socio-political events and their alternation of hopes and frustrations provide an opportunity to examine whether members of the society in crisis experience the successive macrolevel events in

which they are embedded. The present study examined the 2010–2015 revolution in Tunisia to assess citizens' subjective experience of the macrolevel succession of socio-political stages developing around them. To conduct this study, we needed a concept upon which our research method could rest.

The concept of emotional climate

Emotions play a critical role in the unfolding of social movement and political protest (e.g., Becker & Tausch, 2015; Drury & Reicher, 1999; Goodwin, Jasper, & Polletta, 2009; Jasper, 1998; Marcus, Neuman, & MacKuen, 2000; van Stekelenburg & Klandermans, 2009; Van Zomeren, Spears, Fischer, & Leach, 2004). Emotions stimulate social sharing: They systematically spark a need to share what happened with people around (Rimé, Mesquita, Boca, & Philippot, 1991; for review, Rimé, 2009). Because recipients of emotion sharing also experience emotion, they share what they heard with own targets, thereby fuelling a process of social diffusion (Christophe & Rimé, 1997; Curci & Bellelli, 2004; Harber & Cohen, 2005). When an emotional event strikes people collectively, this process is considerably enhanced. Everyone talks to everyone, thus reactivating emotions and the need to share. Collective events thus trigger chain reactions that build up an *emotional climate* (EC) in the collective (Rimé, 2007).

Assessing the state of mind of a nation during a revolution could rest on EC. Introduced by de Rivera (1992; de Rivera & Páez, 2007), the concept of EC refers to predominant collective emotions generated in a group or nation in a given socio-political context. EC can involve feelings such as the collective fear imposed by dictatorship, the mutual trust essential to the formation of social cohesiveness, the collective security provided by an attention to human rights, or the anger aroused by pervasive corruption (de Rivera & Páez, 2007). A decisive feature of EC rests on the way it is assessed. Respondents are not asked how they themselves feel in the current socio-political situation. Rather, they are questioned on their perception of how people around them are feeling. Respondents are thus granted the status of observers of the emotional situation prevailing in their social environment. Climates assessed in this manner are objective in the sense that they exist apart from an individual's personal feelings. They reflect individual respondent's perception of how the majority of others are feeling currently (de Rivera, 1992).

Assessing EC

Páez *et al.* (1996) developed a short Perceived Emotional Climate Scale (PECS) well suited for assessing EC in large-scale investigations. Respondents rate to what degree they believe most people in their society feel a variety of emotions. Items covariations evidenced two stable underlying dimensions: one including positive items and another including items such as anger, fear, anxiety, or sadness. This takes only a moment to administer, which makes it particularly suitable for investigations conducted on large groups.

Assessing EC is particularly appropriate in transitional contexts formed in a society as a result of particular structural socio-political situations such as intractable conflicts, wars, revolutions, peace processes, or regimes of terror (Bar-Tal, Halperin, & Rivera, 2007). A negative context may be felt as threatening, stressful, or unjust and may evoke beliefs about insecurity and distrust, as well as emotions of fear, anger, and hatred. A positive

context can be peaceful or harmonious and may evoke beliefs of security and trust as well as emotions of hope and tranquillity (Bar-Tal *et al.*, 2007). EC was fruitfully assessed in a broad variety of transitional contexts such as the Madrid 2004 terrorist bombings (Conejero & Etxebarria, 2007; Páez, Basabe, Ubillos, & González-Castro, 2007), the 1992 World Exhibition in Seville (Fernández-Dols, Carrera, De Mendoza, & Oceja, 2007), the exposure to political and military repression of Guatemalan Maya communities (Lykes, Beristain, & Pérez-Armiñan, 2007), or the Gacaca post-genocide transitional justice in Rwanda (Kanyangara, Rimé, Philippot, & Yzerbyt, 2007; Rimé, Kanyangara, Yzerbyt, & Paez, 2011).

Four research questions

We assessed the evolution of the EC as perceived by ordinary citizens over the course of the Tunisian revolution (see Appendix A) that began in December 2010/January 2011 and – although still in evolution – led to an important national consensus in December 2014/January 2015. Four questions were investigated. The first one addressed the basic issue raised in this introduction: Do people perceive variations of the objective macrolevel events developing in the course of the revolution period? In other words, do citizens' PECS answers vary in function of the socio-political evolution in their country? Second, going one step further in the reasoning, we tested the existence of stages in the revolution process as proposed in Brinton (1938/1965) model. To what extent did respondent's PECS answers reveal clearly discernible stages during the investigated period?

Assuming that such stages were evidenced, the third question addressed whether these stages fitted the actual socio-political facts of the Tunisian revolution. A qualitative assessment of this question would allow evaluating four predictions directly derived from Brinton's model: (1) During the first stage, or *stage of opposition* between the moderates and the radicals, one would expect a short period of extreme euphoria, hope, and joy, followed by a succession of enthusiasm and disappointment; (2) during the *crisis stage* in which the radicals supplant the moderates, the enthusiasm of the masses is expected to decline rapidly and to give way to a growing state of anxiety and an increase in negative emotions; (3) during the *stage of terror*, fear and anxiety are predicted to dominate the picture in a continuous manner, along with a very low level of positive emotions; (4) finally, the *stage of convalescence* is expected to correspond to emotional relief in the population, and thus to a reduction of negative emotions and a return of optimism and positive emotions. Thus, assessing these four predictions allows examining the degree of correspondence between a triple set of elements: the EC as perceived by Tunisian citizens, the socio-political facts of the Tunisian revolution, and the theoretical model of the stages of a revolution hypothesized by Brinton.

The fourth research question addressed respondents' identification to the Tunisian nation. In view of the essential role attributed to this variable in collective action studies (e.g., Drury & Reicher, 2009; Klandermans, 2004; van Stekelenburg & Klandermans, 2009; Van Zomeren *et al.*, 2008), a scale assessing this construct was included. Collective identities are in no way a trait or stable attribute of individuals. They are constantly 'under construction' (Jenkins, 2004). They implicitly or explicitly refer to the pride of being a member of the group (van Stekelenburg & Klandermans, 2009). We thus examined the relationships existing between collective identity and EC perception. We also assessed how far the ups and downs of a period of revolution affected positively or negatively the extent to which citizens felt part of their nation.

Method

Data collection procedure

As of 4 March 2011, the study questionnaire was posted on a website that remained continuously available to the respondents until the end of the data collection. The only interruption took place between 25 June 2012 and 16 January 2013 due to temporary unavailability of the website for technical reasons. The website link was aired monthly with calls for participation issued by three Internet sources: the Institut Supérieur des Sciences Humaines of the University of Tunis El Manar, the Association 'Recherches et Etudes en Psychologie-Ibn Charaf', and the online magazine *Leaders*, an independent publication intended to promote exchange of ideas in Tunisia. The language used was French, an official language in Tunisia practised by two-third of the population.

When clicking the hyperlink to the study questionnaire, a screen invited readers to contribute to a university study intended to assess the EC and feeling of social belonging in the Tunisian population during the period of change developing in the country. Confidentiality was guaranteed. Respondents who accessed the website first provided their socio-demographic status and then answered both scales.

Responses and respondents

The data examined in this article are based on the questionnaires completed between 4 March 2011 and 24 June 2012 and then again between 17 January 2013 and 24 February 2015. During the two completion periods, a total of 6,634 responses were collected. Of these, 106 responses were excluded because less than half of the items were filled in, leaving a total of 6,528 responses in the database. All missing data were replaced by the mean of the distribution of the relevant variable.

The final sample comprised 2,699 females (41.34%) and 3,816 males (54.46%), with no gender reported in 13 cases (0.20%). Respondents were aged <30 in 1,331 cases (20.39%), 31–40 in 911 cases (13.96%), 41–60 in 2,492 cases (38.17%), and over 60 in 1,763 cases (27.01%); age was not provided in 31 responses (0.47%). All respondents were of Tunisian origin. The question regarding the place of residence revealed that 5,547 responses (85.01%) came from Tunisia, while 964 cases (14.77%) came from a foreign country (17 not reported). As to their region of origin, respondents mentioned (262 not reported; 4.10%) North-east in 3,487 cases (53.47%), North-west in 319 cases (4.89%), East Centre in 1,633 cases (25.02%), West Centre in 380 cases (5.82%), and South in 447 cases (6.85%). Regarding occupation (four not reported; 0.06%), 825 responses originated from students (12.64%), 2,320 from public sector employees (35.59%), 1,437 from private sector employees (22.01%), 1,578 from liberal professions (24.17%), 145 from retired (2.22%), and 219 from unemployed (3.35%).

Design

Along the 4 years of data collection, all Tunisian citizens had the opportunity to access the website and contribute to the study. Thus, the same respondent could have provided multiple responses at different times. For 92.4% of them, respondents agreed to provide their email address, which allowed clarifying this issue. The majority of responses (37.89%; $N = 2,521$) emanated from single contributions. Respondents who contributed two to five times represented 32.43% ($N = 2,158$). Finally, 13.87% ($N = 923$) contributed 6–10 times and 8.25% ($N = 549$) more than 10 times. As multiple contributions of the

same participant were clearly spread across the 4 years of the data collection period, we decided to treat them as if they were independent data points.

The study focus being the temporal evolution of respondents' perception EC, the statistical analyses had to rest on the comparison of successive time windows, or blocks. Blocks of 1 month comprised only a small number of respondents in some cases, whereas blocks of 2 months always had $N > 50$ (see Appendix B). We thus divided the 4 years of observation (from March 2011 to February 2015 included) into blocks of 2 months. Because no data were collected for a 6-month period in 2012 (from July to December), the study design comprised a total of 21 useful blocks. All the statistical analyses consisted in comparisons of these blocks.

Perceived Emotional Climate Scale

The PECS (Páez *et al.*, 1996) assesses people's perception of their society's current EC. Thus, participants responded as observers of their own society. They rated eight items on 5-point scales (1 = *not at all*; 5 = *very much*) preceded by the sentence: 'At this time, in the country, the climate, or emotional atmosphere, is one of. . .' Five items assessed positive PEC: 'hope', 'solidarity and mutual help', 'trust in institutions', 'joy, confidence, and contentment', and 'in which one can talk peacefully'. Three items assessed negative PEC: 'fear and anxiety', 'anger, hostility, and mutual aggression', 'sadness, passivity, and low morale'. A principal component analysis (PCA) followed by varimax rotation yielded two dimensions explaining 33.05% and 29.47% of the variance, respectively. The first one had high loadings (from .623 to .765) for all five items assessing positive climate, and the second one had high loadings (from .826 to .854) for all three items assessing negative climate. To keep the same number of items in both subscales, we discarded the two items with the lowest loadings on the positive climate dimension. Thus, 'hope', 'solidarity and mutual help', and 'trust in institutions' were averaged in a positive PEC score ($\alpha = .72$), whereas all three negative climate items were averaged in a negative PEC score ($\alpha = .84$).

Identification with the Tunisian society

This scale assessed the extent to which participants felt part of the Tunisian society using items largely inspired from Hinkle, Taylor, Fox-Cardamone, and Crook (1989) to be rated from 0 (*not at all*) to 6 (*very much*): (1) I am glad to be a member of our society; (2) I identify with the members of our society; (3) I have little respect for our society (reversed scoring); (4) I feel strong ties with the other members of our society; (5) I think that our society has not much to be proud of (reversed scoring); (6) I am like the other members of the society; and (7) the society reflects very much what I myself am. A PCA revealed the presence of two factors accounting for 47% and 16%, respectively. The five items loading on the first factor (1, 2, 4, 6, and 7) were averaged to form a social identification index ($\alpha = .84$).

Results

During the 21 blocks of our analyses, respondents self-selected. No control could be exerted on their distribution in function of their personal characteristics across these periods. We thus checked the potential impact of disparities in distribution of gender, socio-economic status, and residence in Tunisia versus abroad. To this end, we conducted

ANOVAs crossing each of these demographic variables with the blocks for the three main dependent variables (positive PEC, negative PEC, and social identification) in order to examine whether the interaction reached statistical significance.

For gender, no interaction was significant, all Fs (27, 6478) < 1.0. For profession, positive PEC and negative PEC failed to yield a significant interaction, Fs (60, 6295) < 1.0, but social identification did, F (60, 6295) = 1.32, p = .05. Specifically, in 2011–2012, private sectors employees and unemployed people evidenced a higher level of social identification than public sector employees and students. For residence in Tunisia or abroad, no interaction was significant, all Fs (20, 4469) < 1.0. In sum, the disparities in the distribution of demographic variables exerted a negligible impact upon the study measures. We therefore decided to disregard them in the examination of the successive research questions.

Question 1 – PEC variations over time

Do people perceive the variations in the macrolevel events developing in the course of the revolution period? Brinton (1938/1965) prototypical revolution begins with euphoria, is followed by a major climate deterioration that culminates in a stage of terror, and ends with return to ordinary life. Clearly, this predicts a quadratic relationship between PEC and time. Examination of positive and negative PEC data over time should thus provide an initial test of the empirical validity of the model.

We computed the mean response on each index within each of the 21 blocks of the design (Figure 1) and conducted two regression analyses using each index as criterion and time as predictor (centred after including appropriate values for the three blocks with missing data). Additional nonlinear regressions then examined the quadratic relation of time over and above the linear predictor. For the sake of completeness, a cubic time predictor was also considered.

There was no evidence of a significant linear relation of time for positive PEC, $b = -0.0099$, $t(19) = -1.03$, $p > .250$, $R^2 = .053$, or for negative PEC, $b = .0065$, $t(19) = 0.63$, $p > .250$, $R^2 = .020$. As predicted, the quadratic predictor proved highly significant in both regression models, $b = .0064$, $t(18) = 8.18$, $p < .001$, $DiffR^2 = .746$, for positive PEC, $b = -.0065$, $t(18) = -6.47$, $p < .001$, $DiffR^2 = .685$, for negative PEC. A consideration of the cubic term failed to improve prediction significantly.

These data show that, for positive PEC, the highest levels were observed at the beginning and at the end of the 4-year period, with a dip around the transition from the second to the third year. In sharp contrast, negative PEC started at a very low level, culminated around the middle of the observation period, and went down again towards the end of the 4 years. Thus, the psychosocial variables under scrutiny not only varied significantly across the 4-year period but also evidenced the general quadratic shape predicted from Brinton's model.

Question 2 – PEC stages

How far did respondent's PECS answers reveal clearly discernible 'stages' as proposed by Brinton's model? We examined whether distinct qualitative stages in PECS data could be distinguished along the revolution process. Our analysis adopted three strategies. First, we relied on a visual inspection of the successive bimonthly means of the positive and negative PECS items. Secondly, we compared various ways by which we could group the means of each individual emotion into separate stages. Finally, we examined the relative
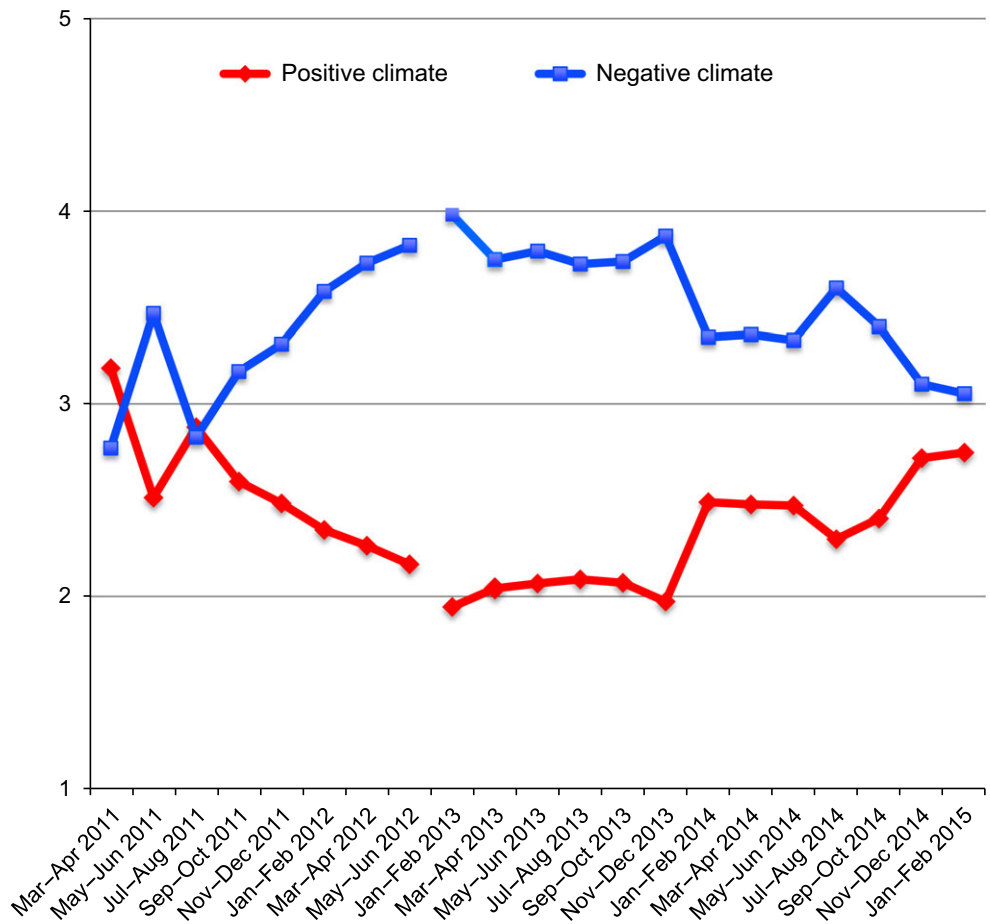
Figure 1. Values of the positive and negative climate scales (from 1 to 5) for each of the 2-month blocks. [Colour figure can be viewed at wileyonlinelibrary.com]

coherence of the PECS items as a function of their valence. These analyses were conducted both on the eight 2-month blocks preceding the interruption of the data collection, and on the 13 2-month blocks following this interruption.

Visual inspection
Figure 2 displays the mean values observed for the six PECS items for each of the 2-month blocks during the 4 years of data collection. Clearly, a mixed or ambivalent pattern prevailed at the outset of the revolution. From March–April 2011 to September–October 2011, positive and negative PEC items overlapped and evidenced successive ups and downs, with the notable exception of trust, which yielded a continuously low average value. From November–December 2011 on, however, the overlaps stop, showing both a continuous deterioration of the positive climate items and escalation of the negative climate items. Thus, the visual inspection suggests the existence of two distinct stages among the eight 2-month blocks of the first part of our data.
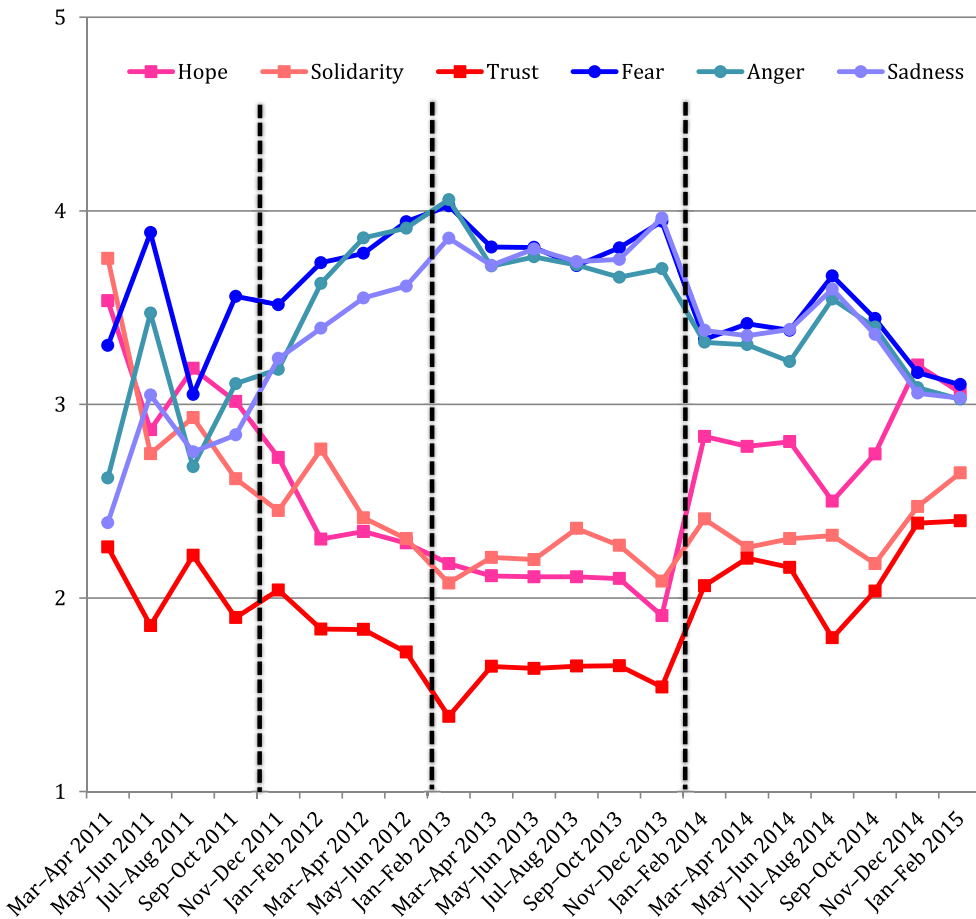
Figure 2. Values for the six PEC items (from 1 to 5) for each of the 2-month blocks. [Colour figure can be viewed at wileyonlinelibrary.com]

As for the period following the interruption of the data collection, visual inspection of Figure 2 also suggested two distinct stages. The first runs until November–December 2013 with four characteristics: (1) Values for both positive and negative PEC items remain remarkably stable throughout this stage, (2) the negative PEC items overlap up to the point that they become indistinguishable, (3) positive and negative items are strongly polarized, and (4) all positive items show a sharp growth and all negative items a marked decline beyond November–December 2013. In comparison, the following stage shows a clear increase for positive PEC values and a decrease for negative PEC values.

Grouping of the means

In order to distinguish the stages in more detail, we turned to a systematic evaluation of the explanatory power of contrasts, opposing various groupings of means for each of the six PEC items. Turning to the two initial stages first, we conducted a regression analysis for each of the six PEC items using the means as our criterion and one of several effect-coding contrasts opposing the eight 2-month blocks (2/6, 3/5, 4/4, 5/3, 6/2). We then compared the R^2 for each of the six regressions for each of the contrasts. For instance, we conducted

Table 2. Inferential statistics (R^2, F, p, η^2) as a function of the specific contrast used to compare the eight initial 2-month blocks

	Contrast				
EC Item	2/6	3/5	4/4	5/3	6/2
Hope	.32	.56	.74	.73	.40
Solidarity	.46	.51	.38	.21	.28
Trust	.10	.43	.30	.46	.33
Fear	.00	.24	.26	.36	.29
Anger	.10	.41	.53	.67	.51
Sadness	.31	.53	.75	.65	.48
$F(1, 6)$	1.70	6.51	8.45	8.46	4.83
p	.24	.04	.03	.03	.07
η^2	.22	.52	.58	.58	.45

Table 3. Inferential statistics (R^2, F, p, η^2) as a function of the specific contrast used to compare the 13 final 2-month blocks

	Contrast				
EC Item	4/9	5/8	6/7	7/6	8/5
Hope	.35	.50	.84	.62	.40
Solidarity	.13	.13	.32	.20	.28
Trust	.40	.52	.76	.62	.33
Fear	.36	.47	.74	.53	.29
Anger	.51	.58	.73	.57	.51
Sadness	.32	.42	.74	.60	.48
$F(1, 6)$	6.71	10.52	36.89	15.70	9.53
p	.03	.01	.0001	.002	.01
η^2	.38	.49	.77	.59	.46

a regression with the 8 means for hope, computed over the 2-month blocks, as our criterion and an effect-coding contrast, assigning a 1 for the first two 2-month blocks and a -1 for the six remaining blocks, as our predictor. As can be seen in Table 2, this analysis delivered a R^2 of .32. Clearly, the two effect-coding contrasts that delivered the best set of R^2 were 4/4 and 5/3 (Table 2). We also examined the F, p-value, and *effect size* associated with these various contrasts in the context of a repeated-measures analysis using all six items simultaneously. Again, the 4/4 and 5/3 contrasts delivered the best statistics. The values associated with the neighbouring contrasts suggested the 4/4 contrast as the best option. In other words, a very good way to organize the eight blocks into two stages is to group the initial four blocks into a stage 1 and the four remaining blocks into a stage 2.

We then compared the final 13 2-month blocks using the same procedure by means of different effect-coding contrasts (4/9, 5/8, 6/7, 7/6, 8/5). As can be seen in Table 3, the 6/7 contrast was the best. As before, we relied on these contrasts to conduct a series of repeated-measures analyses with all six items. Here too, the 6/7 contrast was the most satisfactory. That is, the best manner to organize the 13 blocks into two stages is to group the initial six blocks into a stage 3, and the seven remaining blocks into a final stage 4.

Coherence of the stages

The above analyses allow for the delineation of four stages in the PEC data collected between March 2012 and February 2015. As a further check for the validity of distinguishing four stages, we examined the extent to which the PEC items hang together as a function of their valence. We computed, for each respondent, a square distance score between each PEC item and each of the five others, thus securing a total of 15 distance scores. We then created three scores by averaging separately the three distances involving pairs of positive PEC items, the three distances involving pairs of negative PEC items, and the nine distances involving pairs of positive and negative PEC items. We reasoned that the ratio between (the square root of the product of) the average within-valence distances and the average between-valence distances would provide a good indication of the polarization (a lower ratio) versus chaos (a higher ratio) in PEC.

To determine the appropriate cutting points between the four periods, we conducted a regression series using the same effect-coding contrasts as before as our predictors and the above ratio as our criterion. Confirming earlier findings, and as far as stages 1 and 2 were concerned, the 4/4 contrast provided a better fit to the data, $R^2 = .75$, than either the 3/5 or the 5/3 contrast, $R^2 = .53$ and $R^2 = .69$, respectively. Regarding stages 3 and 4, the 6/7 contrast again fitted the data better, $R^2 = .72$, than either the 5/8 or the 7/7 contrast, $R^2 = .40$ and $R^2 = .58$, respectively.

Clearly, these three different ways of examining the data all point to the same general conclusions. In all three cases, it makes sense to demarcate within our 21 2-month blocks of observations a first stage of four blocks, a second stage of four blocks, a third stage of six blocks, and a final stage of seven blocks (Figure 2).

Question 3 – Brinton's stages, PEC stages, and Tunisian socio-political facts

Having ascertained the reality of the four stages in the Tunisian PEC data, we examined whether they matched the climates suggested in Brinton's stages. In addition, we assessed whether the major socio-political events that occurred in Tunisia over the course of our PEC stages fitted Brinton's model (see Table 4).

First PEC stage

Brinton described the first stage of a revolution as a stage of *opposition between the moderates and the radicals*. This stage involves initially a short period of extreme euphoria, hope, and joy, followed by a succession of enthusiasm and disappointment and by a growing feeling of frustration.

Our first PEC stage rests upon four 2-month blocks, all in 2011. Confirming the initial euphoria described by Brinton, the first block exhibits very high levels of hope and solidarity and comparatively low levels of anger and sadness. The next three blocks manifest ups and downs. In May–June as well as in September–October, all negative indicators rise and all positive indicators decline, while the reverse trend occurs in July–August. These findings support the instability and indecision described in Brinton's first stage.

As regards socio-political facts, and in line with Brinton's analysis, the moderates were in power during the first stage and the revolution process progressed rapidly. The former ruling party was dissolved, lawsuits against its members were launched, and the new government prepared democratic elections. Yet, in accordance with Brinton's model, the

Table 4. Socio-political facts of the Tunisian revolution

Stage 1 (March 2011–October 2011)

Opposition between the moderates and the radicals

- The moderates are in power; many actions are taken to dissolve the old regime
- Repeated street demonstrations express citizens' concerns about the future. A curfew is imposed
- May – the first clashes between gunmen and security forces make victims among the latter
- June – the first violent confrontations between rival political groups cause 11 dead and over 100 injured. The first acts of violence by religious radicals are perpetrated
- September/October – violent protests by radical religious groups trigger protest rallies among moderates
- In October, elections result in the victory of radical religious party Ennahda

Stage 2 (November 2011–December 2012)

Crisis

- Ennahda's number 2 forms the new government with a radical religious majority
- Ennahda demand sharia to be the basis of legislative policy, question gender equality, and prepare a constitution devoid of reference to human rights or freedom of conscience
- First semester – a succession of clashes reflect the growing power of radicals and their claims. Their acts of violence and vandalism cause mass responses from moderates
- Second semester – the cleavage between radicals and moderates aggravate with recurrent protest rallies, riots, and violence. In September, radicals attack the US embassy
- Late 2012 – a wave of strikes by professional corporations reflect the saturation of ordinary citizens
- December – several armed clashes oppose terrorists and security forces

Stage 3 (January 2013–December 2013)

Reign of terror

- The radicals establish leagues of protection of the revolution composed of activists
- The leagues perpetrate frequent attacks against opposing political parties. Their assaults are often left unpunished
- The assassination of major leaders of opposing parties triggers mass demonstrations; radicals' offices are vandalized
- In the summer, recurrent confrontations oppose the army and Salafi terrorists in the Western Region, resulting in dozens of deaths on both sides
- July – four leading groups (the quartet) initiate a 'National Dialogue' to get out of crisis
- The quartet proposes a road map for accelerated adoption of a constitution, the organization of democratic elections and for radical government's resignation
- October – the road map has been signed by 21 political parties
- The National Dialogue starts, imposing the various players a spirit of consensus
- The head of government promises to resign under the terms of the road map

Stage 4 (From January 2014)

Convalescence

- A new constitution is adopted almost unanimously; Tunisia thus enters democracy
- The Islamists withdrew from power and a non-partisan transitional government is formed
- The state of emergency declared in 2011 is lifted
- Holding parliamentary and presidential elections is voted
- October – anti-Islamist party Nida Tounes wins parliamentary elections and the first democratically elected parliament takes office
- Presidential elections are won by the founder of the anti-Islamist party; he promises to be 'the president of all Tunisians'
- A member of the anti-Islamist party who held several posts under the former regime forms the new government; the Islamist party expresses readiness to 'cooperate fully' with him
- Yet, all along the period, continued violence developed between the army and members of terrorist groups, in particular at the country's borders

socio-political situation soon deteriorated, with street demands from ordinary citizens and with pressures – sometimes violent – from religious radicals. In September–October 2011, an alternation of protests and rallies confirmed the strengthening of the opposition between moderates and radicals.

Second PEC stage

Brinton's second stage is a *crisis* during which the radicals supplant the moderates. The masses' enthusiasm declines rapidly giving way to a growing anxiety and increased negative emotions.

Our second PEC stage comprises four measurements points. From the first to the last of them, all three indicators of negative PEC continuously rise, whereas all three indicators of positive PEC present a trend in the opposite direction. This marked deterioration of the climate is fully consistent with Brinton's predictions.

As for socio-political facts, at the end of October 2011, the radical religious party Ennahda supplanted the moderates, launching a 'crisis' stage, exactly as Brinton predicted. Once in power, in line with the model, the radicals developed a totalitarian, 'steamroller' attitude (Chouikha & Gobe, 2013, p. 4), thereby confirming Brinton's assertion that the radicals push through their goals without regard for injured human dispositions, imposing major changes in the society, led by their belief in the Absolute. As the model suggests, the enthusiasm of the masses declined rapidly and a considerable deterioration of the socio-political milieu followed.

Third PEC stage

In Brinton's model, *terror* reigns in the third stage. Fear and anxiety dominate the social atmosphere continuously.

The third PEC stage rested on six 2-month blocks, all of them in 2013. All six PEC indices are flat, suggesting that the socio-political atmosphere remained homogeneous during this period. At the same time, an extreme contrast prevails between positive and negative PEC indicators, the former being at floor level, whereas the latter approached ceiling. This polarization of the valence of the PEC fits entirely Brinton's description of terror.

Tunisian events in 2013 (Table 4) clearly matched Brinton's description (Table 1). Constant threat dominated social life, a special police appeared, irregular acts of violence were perpetrated, and uncertainty and fear developed. The reign of terror cannot last long – a few months or so, according to Brinton – because outsiders are pushed to the limits of their endurance.

Fourth PEC stage

In the model, a revolution concludes with a stage of *convalescence*. The reign of terror comes to an end, giving way to emotional relief. This stage should thus manifest a lowering of negative emotions and a moderate return of optimism and positive emotions.

The fourth PEC stage comprised seven measurement points, six of them in 2014 and one in January–February 2015 (see Figure 2). The transition from the third to the fourth PEC stage corresponds to both a sharp decrease in all three variables of negative PEC and a sharp increase in all three variables of positive EC. This matches Brinton's proposition of an emotional relief once the fourth stage is reached. Convalescence implies that the patient has not yet healed and that ups and downs

would still occur. The PEC data nicely support this conjecture as a short-lived rise in negative emotions and drop in positive emotions are observed in July–August 2014. Yet, from the first to the seventh measurement point of our fourth stage, positive emotions kept increasing, while negative emotions kept decreasing. Again, our data strongly support Brinton's model.

In Tunisia, the transition to convalescence was initiated in July 2013, or 6 months after the start of the reign of terror. In Brinton's view, power is needed to conduct the transition. When laws, customs, habits, and beliefs tie men together insufficiently, Brinton noted, force must be used to remedy this insufficiency so that a tyrant, or unconstitutional ruler, is brought to power. Interestingly, no such dictatorship took place in Tunisia. Rather, a conglomerate of moral, symbolic forces substituted a military power solution. This conglomerate, composed of the Tunisian General Labour Union, the Patronage, the League of Human Rights, and the National Bar Association, succeeded in breaking the cycle of pressures and violence. It paved the way to a National Dialogue, thus demonstrating that considerable power can be found in a democratic process. Radicals were not imprisoned or executed. The National Dialogue was able to convince them to give up power and to accept the results of new democratic elections. As predicted by Brinton, the transitional process allowed the moderates to return to power and to invest their efforts in the restoration of a stable status quo and in the moderate pursuit of progress.

Question 4 – Identification with the Tunisian society

Social identification scores evidenced a marked positive correlation with those of positive PEC, $r(6526) = .465$, $p < .0001$, and a significant negative correlation with those of negative PEC, $r(6526) = -.261$, $p < .0001$. To assess whether social identification varied with the ups and downs of the revolution process, we conducted an ANOVA comparing the identification scores collected during our four PEC stages. This yielded a significant stage effect, $F(3, 6524) = 41.17$, $p < .001$, $\eta_p^2 = .019$. According to a *post-hoc* Tukey HSD test, the mean score of the first stage, $M = 3.309$, $SD = 1.317$, was significantly higher than those of the three other stages. The mean score of the second 'crisis' stage, $M = 2.644$, $SD = 1.293$, and of the third 'terror' stage, $M = 2.698$, $SD = 1.425$, did not differ significantly. Finally, the mean score of the fourth 'convalescence' stage, $M = 2.911$, $SD = 1.351$, was significantly higher than those of the previous two.

As a final check of the extent to which identification and positive PEC behave in similar ways, we conducted the same regression analysis as above using the social identification as our criterion and time as our predictor (again centred after including appropriate values for the blocks with missing data). Additionally, a nonlinear regression examined the quadratic relation of time over and above the linear predictor. There was no evidence of a significant linear relation of time, $b = -.0038$, $t(19) = -0.46$, $p > .648$, $R^2 = .011$. Replicating what was observed for the positive PEC, inclusion of the quadratic predictor proved highly significant, $b = .0047$, $t(18) = 4.78$, $p < .001$, $DiffR^2 = .553$.

As a set, these analyses provide strong evidence that social identification indeed varies in line with the ups and downs of the revolution process.

Discussion

We seized the opportunity of the socio-political events in Tunisia to examine psychosocial variables in a radical social movement of the revolutionary type. Collecting empirical data

from a population undergoing a long period of revolution is obviously a challenge. The level of development of the Tunisian population, which counts among the highest on the African continent, provided such an opportunity. To our knowledge, this is the first time that a social–psychological study has been carried out on a collective movement of this magnitude.

Our study relied on the dynamic theory of revolution elaborated by Brinton (1938/1965) from his observation of the socio-political constants of major historical revolutions. The theory places a particular emphasis on collective emotions and specifies four successive phases in any revolutionary process. The study aimed to examine the extent to which members of a society perceive the macrolevel factors that unfold around them. This issue was recently defined as both crucial and unresolved in research on social movements (Klandermans, 1997; van Stekelenburg & Klandermans, 2009). Its critical character is obvious, as the dynamics of participation in social movements is a direct function of people's capacity to perceive the characteristics of the societal context.

To examine this issue, we adopted PECS measurements (de Rivera, 1992; de Rivera & Páez, 2007) that are special in the sense that they do not monitor respondents' own reactions in the face of current events but transform them into observers of their social world. They thus report the EC they perceive as prevailing in their society at a given moment: Is the collective experiencing joy, or fear, or sadness? In the context of collective events, the state of mind of any given individual matters less than the shared atmosphere. Anyone in the society can perceive this climate in sharing emotions with close ones, in observing and exchanging with neighbours and colleagues, in walking across the streets of the city or the village, in listening to or reading the news. Somehow, the PECS responses provided by any given citizen may be seen as representing more than $N = 1$. Of course, the integration of a large number of such observations lends a unique and indeed significant insight about the collective. Said otherwise, PECS measurements provide data of a higher consistency than measurements assessing personal subjective reactions. This may explain that disparities in demographic variables failed to affect such measurements. Because participants used an 'observer' mindset, different observers likely perceived similar effects in the same society, especially when these effects have the emotional force typical of a period of revolution.

Our results provided clear positive answers to all four research questions. First, regarding people's capacity to perceive the variations in their societal situation, PEC measurements varied significantly across the investigation period and their variations evidenced the quadratic shape predicted from Brinton's model. These findings thus show (1) that psychosocial measurements can index a process of socio-political transformation and (2) that citizens can detect and translate macrolevel changes unfolding in their society. Second, our analyses supported the validity of Brinton's classic theory of revolutions, a theory never tested empirically previously. Brinton (1938/1965) model claimed that revolutions, far from being chaotic, proceed in an ordered sequence of 'initial euphoria, degradation, terror, and restoration'. The highly significant quadratic relationship evidenced between PEC measures and the temporal evolution of the Tunisian revolution clearly support this claim. Additionally, three different methods consistently highlighted four distinct stages in the evolution of PEC during this revolution, as predicted by Brinton's model. Third, a detailed examination of PEC indicators alongside the socio-political developments in Tunisia during our four PEC stages proved highly consistent with the prototypical sequence of events described in Brinton's four-stage model. Finally, social identification proved closely related to the temporal evolution of positive PEC scores. In

sum, our study unquestionably confirms Goldstone's (2003) view that the model developed by Brinton in 1938 'also fit remarkably well cases that arose decades later' (p. 56).

The study achieved a triple outcome. First, citizens detected variations occurring in the macrolevel events of the revolution. Second, variations they detected closely fitted the prototypical changes described by a classic model of revolution. Third, the prototypical changes alleged by Brinton's model closely corresponded to the real socio-political events that developed during the Tunisian revolution. These findings provide a clear answer to an issue that was recently defined as both crucial and unresolved in research on social movements (Klandermans, 1997; van Stekelenburg & Klandermans, 2009): People closely perceive the variations of a national context of which they are a part.

The present research comes with a number of limitations. Respondents' representativeness remains an open question. One reassuring piece of evidence is that participants came from the entire territory, with balanced representation from all geographical corners of the country. The fact that the survey necessitated access to the Internet and required some level of instruction may also be an issue. Yet, Tunisia is well known for having a high-quality educational system and was the first Arab and African country to connect to the Internet in 1991. Numeric networks have disseminated in all layers of the population. One last aspect concerning respondents is that a same contributor could contribute several times. However, we observed that a majority contributed only once. Finally, we faced a 6-month interruption in the data collection due to technical incidents. But this gap might not come as a real problem as far as the test of Brinton's four-stage model is concerned. Marked differences occurred between what we characterized as stages 2 and 3 of the revolution process, making the determination of the exact breakpoint a secondary question.

Our study touches on a key issue of the social psychology of collective action recently raised by Livingstone (2014) who stressed that there is *a point at which* an individual goes from doing nothing to doing something, or shifts from doing one thing to doing something else. Livingstone proposed that such 'points' are better conceptualized as qualitative transformations. In nature, substances not only get warmer or cooler. At certain points, changes in temperature result in qualitative transformation as the substance freezes, melts, or boils. This example echoes the abruptness with which revolutions in North Africa and the Middle East developed in 2011. Livingston insisted that qualitative transformation represents a major blind spot in the social psychology of collective action. He suggested that large-scale transformations in phenomena would better be understood as disturbed equilibrium in systems involving competing forces. Thus, stability or stasis does not necessarily indicate the *absence* of factors that would precipitate change. Rather, opposite forces neutralize these factors. But at some point, the quantitative change breaks the equilibrium, allowing abrupt change.

Livingstone thus advocated in favour of a social psychology of points of transition investigating *in situ* moments of change within and between individuals, and between interacting groups. Our study comes close to such a social psychology. Our PEC measurements precisely assessed the conflicting forces and a close look at Figure 2 allows observing the dynamics of their opposition. Also, our moment-to-moment measurement times allowed following closely the temporal progression of events. In addition, in parallel with our 2-month blocks, we recorded detailed changes in the Tunisian socio-political situation. However, the size of our observational windows prevented us from conducting the qualitative transformation analysis suggested by Livingstone. Using 2-month blocks did not give us the needed fine-grained analysis tool. To illustrate, on two occasions, major political leaders were murdered during our data recording. The considerable collective

emotions aroused by these events in the population were simply lost in the PEC data collected during the 2 months that followed. Fine-grained data collection is thus critical to meet the important aims proposed by Livingstone. Yet, collecting daily questionnaires in large numbers from a same population is a challenge. But new tools are available to research nowadays such as tweets and comments on social networks. Analysing the content of such exchanges offers a very promising avenue for the study of qualitative transformation.

To conclude, we have to address the question of the generalizability of the model supported by our data. Recently, Libya, Yemen, Syria, and Bahrain all experienced popular uprisings that could lead to doubt the idea that revolutions do not imply chaos. Do these examples disconfirm the model? In fact, Brinton's model essentially addressed the dynamics of struggle for power there where a State remains fully sovereign. In Libya, Yemen, Syria, and Bahrain, popular uprisings elicited both armed conflicts between internal forces and armed intervention of foreign forces leading to the partial or total dissolution of the State sovereignty. The situation of these four countries contrasts sharply with Egypt where sovereignty was fully preserved during the recent revolution. In this country, the revolution largely unfolded in accordance with Brinton's model. In particular, the election victory of the radical religious – 'better organized, better staffed, better obeyed' (Brinton, 1938/1965; p. 134) and aided by a fanatical devotion to their cause – was conducive to the 'Puritan' excesses and followed by the popular disaffection, as predicted by the model. Exactly as described by Brinton, a tyrant, or unconstitutional ruler, was then brought to power, as the disordered situation allowed military leaders to move from obscurity to commanding leadership. In short, the sequence of events that took place in Egypt is even more directly illustrative of the model than what happened in Tunisia where democratic forces rather than military forces prevailed in the final stage of convalescence.

The lesson from the present study is thus unequivocal: Revolutions in the Arab world clearly suggest that Brinton's model applies when the script of the sovereign State is respected. Beyond Brinton's admittedly brilliant yet strictly theoretical analysis, our empirical results go a long way to suggest that preserving the sovereignty of the State and avoiding intervention of foreign forces constitute a critical condition towards collective resilience in the wake of a revolution.

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Appendix A: The investigated transitional context: the Tunisian revolution[1]

In December 2010, protests break out over unemployment and political restrictions, and spread nationwide. In January 2011, President Ben Ali goes into exile amid continuing protests. Former Prime Minister Mohamed Ghannouchi forms a government of national unity. But demonstrators called for a clean break with the past. Essebsi, a veteran of Tunisia political life, replaces Ghannouchi. In May, curfew is imposed amid fresh street protests. In October, Ennahda Islamist party wins parliamentary elections, but falls short of an outright majority. Human rights activist Marzouki is elected president by constituent assembly, whereas Ennahda leader Jebali sworn in as prime minister. In May and June 2012, Salafi Islamic extremists clash with security forces. In August, thousands protest in Tunis against moves by Islamist-led government to reduce women's rights. In February 2013, the killing of the opposition anti-Islamist leader Chokri Belaid prompts violent protests. Ennahda party rejects Prime Minister Jebali proposals to form a government of technocrats. Jebali resigns and is replaced by Larayedh, another Ennahda leader. In May, new clashes occur between police and Salafi Islamists. In July, the assassination of opposition politician Mohamed Brahmi prompts mass demonstrations. In this context, a National Dialogue Quartet (General Labour Union; Confederation of Industry, Trade and Handicrafts; Human Rights League; Order of Lawyers) is set up with the aim to establish a government acceptable by all components of the political scene. After months of wrangling, Mehdi Jomaa, an independent technocrat, is appointed in January 2014 to form a cabinet of independents and technocrats, to govern until new elections. On the same month, the National Constituent Assembly – elected in October 2011 – adopted the new

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[1] *Innumerable chronologies of the Tunisian Revolution are available. The present report closely followed the overview proposed by the BBC news service on the Internet.*

constitution in a climate of national concord. In March, President Marzouki lifts state of emergency imposed in 2011. In October, Nidaa Tounes, which unites secularists, trade unionists, liberals, and some players from the Ben Ali era, wins largest bloc of seats in parliamentary election, overtaking the Islamist Ennahda. In December, the first parliament since the revolution takes office. After decisively beating outgoing President Moncef Marzouki in run-off elections, Nidaa Tounes candidate Essebsi becomes the first democratically elected head of state of the country 4 years after the revolution. He promises to be 'the president of all Tunisians'. In January 2015, former Interior Minister Habib Essid, who has held several positions under Ben Ali, is responsible for forming a government. Ennahda says welcome positively appointing Mr Essid and being, ready to 'cooperate fully' with him. The new government takes office on 29 January. In October 2015, National Dialogue Quartet receives Nobel Peace Prize for helping transition to democracy.

Appendix B: Number of responses collected per periods of 2 months

Periods		Number of responses
Valid	2011 March–April	314
	2011 May–June	175
	2011 July–August	59
	2011 September–October	98
	2011 November–December	97
	2012 January–February	56
	2012 March–April	172
	2012 May–June	72
	2013 January–February	226
	2013 March–April	1,384
	2013 May–June	573
	2013 July–August	567
	2013 September–October	487
	2013 November–December	388
	2014 January–February	459
	2014 March–April	320
	2014 May–June	213
	2014 July–August	136
	2014 September–October	272
	2014 November–December	209
	2015 January–February	259
	Total	6,528