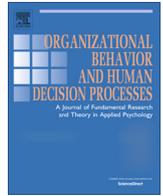




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## Epistemic motivation and perpetuation of group culture: Effects of need for cognitive closure on trans-generational norm transmission

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## ABSTRACT

The role of need for cognitive closure (NFCC, Kruglanski, 2004) in the transmission of a group norm is examined in three studies carried out in both experimental and natural settings. It was hypothesized that for persons high in NFCC a greater resistance to change is produced both via the urgency tendency of newcomers and the permanence tendency of old-timers; accordingly, groups composed of high need for closure individuals should exhibit greater cultural stability than groups composed of low NFCC. The first study investigated that hypothesis in a natural setting where young adults rated their health behavior and that of their parents. Consistent with our hypothesis, results of a moderated regression analysis showed that for participants high (vs. low) in dispositional NFCC the relation between parents' and offspring behavior is stronger, implying normative continuity. The remaining two studies applied Jacobs and Campbell's (1961) paradigm wherein group norms are induced and transmitted across generations of a laboratory microculture. In the first study, NFCC was induced by means of environmental noise whereas in the second study it was varied via group composition, consisting of participants with High vs. Low scores on the NFCC Scale. Results of both studies confirmed the hypothesis that cultures under high need for closure show a greater normative stability across generations. Moreover, the experimental studies clarify that the observed, need for closure based, stability was promoted by newcomers' greater tendency to seize to the group norms in condition of high (versus low) NFCC.

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A defining aspect of culture is the shared reality and a common world view held by its members (Harding & Higgins, 1996). Culture also has a temporal dimension. It persists across generations and is transmitted to new members through the process of socialization. It is also true, however, that cultural stability is undermined by forces of change. Especially this day and age, the possibilities for intercultural contacts are considerable and steadily growing with the ever widening reach of the social media, expanding opportunities for international travel, and swelling waves of immigration that alter the cultural environments of many societies. These circumstances increase the importance of understanding the conditions under which cultural traditions are preserved and those in which the "winds of change" prevail, and the old ways and world-views give way to new realities. Our aim in the present research has been to study this process from a motivational perspective underlying the tendency toward stability versus change. A focal aspect of our perspective on this issue is the need for cognitive clo-

sure (NFCC) that members of a group may experience. In what follows, we describe this particular motivation and discuss its relevance to processes of cultural continuity and change.

The NFCC was introduced in the Lay Epistemic Theory (Kruglanski, 1989; 2004) as a stopping mechanism affording the crystallization of knowledge. NFCC was defined as a desire for a quick and firm answer to a question and the evasion of confusion and ambiguity (Webster & Kruglanski, 1998). Need for closure is assumed to vary along a motivational continuum, ranging from a high need to obtain closure to a strong need to avoid it; it was assumed that the need for closure can be induced situationally but that it also constitutes a stable trait on which persons may vary (Webster & Kruglanski, 1994). The situational antecedents of the need for closure consist of circumstances that highlight the perceived benefits of closure and reduce the perceived costs of lacking closure (augmented by the experience of aversive uncertainty, time pressure, environmental noise, or mental fatigue). By contrast, the need to avoid closure is instilled in conditions that stress the costs of closure and the benefits of lacking closure (e.g., accountability, fear of invalidity, or evaluation apprehension).

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Consequences of need for closure consist of the *urgency* and *permanence* tendencies. The former refers to the inclination to quickly seize on closure promising cues. The permanence tendency reflects the propensity to freeze on a closure once it has been formed and to become impervious to subsequent information that threatens to undermine it. Permanence and urgency tendencies induced by a heightened need for closure affect a wide range of psychosocial phenomena mediated by information processing at individual, interpersonal and group levels (for reviews see Kruglanski, 2004; Kruglanski, Pierro, Mannetti, & De Grada, 2006; Kruglanski & Webster, 1996; Webster & Kruglanski, 1998).

A straightforward implication of the notion that need for closure induces the tendency to preserve existing knowledge is that it promotes resistance to change (Kruglanski et al., 2006). Several lines of evidence from field and laboratory studies converge to support this possibility. For instance, Chiu, Morris, Hong, and Menon (2000) noticed that individuals with higher need for closure are more likely to exhibit the attribution bias typical to their culture (see also Chao, Zhang, & Chiu, 2010) and, under self-esteem threats, to decrease negative evaluations of in-group members (Kosic, Mannetti, & Livi, 2014). Moreover, a meta-analytic review by Jost, Glaser, Kruglanski, and Sulloway (2003) found a relation between individual differences in need for closure and various measures of political conservatism, defined in part as resistance to change. Additionally in organizational settings, need for closure was found to correlate negatively with coping with change and to correlate positively with aversion to change (Kruglanski, Pierro, Higgins, & Capozza, 2007).

Recent developments in Lay Epistemic Theory applied and extended it to groups in conjunction with the MIP-G model (Motivated Information Processing in Groups; De Dreu, Nijstad, & van Knippenberg, 2008). This work demonstrated that high need for closure affects compliance and conformity especially when individuals have a pro-social rather than a selfish motivation (Bechtoldt, De Dreu, Nijstad, & Choi, 2010). Recent studies found also that high need for closure is particularly detrimental to divergent thinking both at the individual level by self-censoring of creative ideas (Rietzschel, De Dreu, & Nijstad, 2007) and, at a group level, by reducing the number of original ideas generated in a brainstorming task (Chirumbolo, Livi, Mannetti, Pierro, & Kruglanski, 2004).

## Overview of present hypotheses and studies

Resistance to change of newcomers and old-timers with high vs. low need for closure may affect the stability of group culture across time. Consider a new member of a group from a different cultural background than members of the host country. Such individual may experience considerable uncertainty as to whether his or her values, traditions, and ideas would be accepted by the old-timers. The influx of new members into a group could be threatening also to the old-timers. The cultural “invasion” by newcomers into the group could undermine its pre-existing worldviews and conventions, and replace them with different customs and perspectives. Thus, whether cultural change would occur may crucially depend on the ability of the newcomers to propose new ideas and solutions brought by their prior experiences and how open the old-timers are to innovations introduced by the newcomers. Specifically, openness to innovation may induce change, whereas closed mindedness may perpetuate cultural stability. In turn, members’ closed and open mindedness may stem from their motivational orientation, and more specifically from their need for closure, as discussed earlier. The relation between members’ need for closure and the perpetuation of group norm was tested in three studies described below. The first study was a field study aimed

at testing our hypothesis in a real-world setting, i.e., in family culture. The remaining two studies were laboratory studies using a *generations design* specifically suited for investigating the transmission of group norms across changing membership, thus replicating cultural evolution in a laboratory setting (Jacobs & Campbell, 1961; Kenny, Hallmark, Sullivan, & Kashy, 1993). Using this paradigm, we investigated the way in which a basic mechanism of norm transmission (conformity of newcomers and stability of old-timers) is affected by the need for closure.

## Study 1

The present study used a cross-sectional analysis of natural family dynamics across two generations in order to examine the relation between offspring’s dispositional need for closure and their acceptance of familial norms. Based on our theory, we predicted a positive relation between offspring’s need for closure and conformity to norms espoused by the older generation.

### Participants

A total of 195 students at the University of Rome “Sapienza,” treated here as members of the offspring generation, were recruited to respond to a family health behavior survey. A total of 62.6% of the participants were females and 38.4% were males; their average age was 21.9, ranging between 16 and 27 years of age (SD = 2.48).

### Measures

The Italian version of the need for closure scale was administered to all participants (Pierro et al., 1995; Webster & Kruglanski, 1994). The original scale consists of five sub-scales measuring the following dimensions of the need for closure: Need for Order, Intolerance of Ambiguity, Need for Predictability, Close mindedness, and Decisiveness. Responses were recorded on a seven-point scale with the alternatives ranging from “completely disagree” (1) to “completely agree” (7). Some of the studies (Kruglanski et al., 1997; Neuberg, Judice, & West, 1997; Roets & van Hiel, 2007), in which the structure of the scale was assessed have shown that the Decisiveness dimension is not significantly related to the remaining dimensions, leading to an alternative operationalization of this measure (Roets & van Hiel, 2011). Therefore, in the present studies, for each participant we computed a general NFCC average score using only the 35 items belonging to the four subscales with significant structural coefficients on the second-order factor referred to as NFCC (Mannetti, Pierro, Kruglanski, Taris, & Bezinovic, 2002), namely Need for Order, Intolerance of Ambiguity, Need for Predictability, and Close Mindedness. The reliability (Cronbach’s alpha) of this scale was acceptable at .79.

The norms of present interest concerned health behaviors. Specifically, participants were asked to respond to four items regarding healthy behavior. These items were: “I run to keep fit” (“Corro per mantenermi in forma”), “From time to time, I allow myself to relax” (“Mi concedo momenti di relax”), “I engage in sport in order to improve my psychological well-being” (“Faccio sport per migliorare il benessere psicofisico”), and “I carry out regular health-examinations to check on the state of my health” (“Faccio analisi per controllare il mio stato di salute”). Participants rated their own behavior and the behavior of each of their parents on seven points scales ranging from never (1) to always (7). Then a mean of the frequencies of each behavior was computed. Reliability coefficient ranged from .65 (self-valuation) to .78 (parents’ evaluation).

## Data analysis

A moderation analyze were conducted using the software Mod-Text (Kenny, 2010). The predictor variable in this case was the perceived health behavior of parents and the outcome variable was the health behavior of the offspring; this relation was hypothesized to be altered linearly by the moderator variable of present interest, namely the Need for Cognitive Closure.

## Results

As seen in Table 1, the overall effect of Parents' Health Behavior on Offspring Behavior, is  $-0.45$  ( $p = .16$ ,  $r = -.10$ ). The overall effect of NFCC on Offspring Behavior, when Parental Health Behavior is equal to zero, is  $-0.65$  ( $p = .071$ ,  $r = -.13$ ). More importantly, the interaction between Parental Health Behavior and NFCC is equal to  $.20$  and is statistically significant ( $p = .03$ ,  $f^2 = .024$ ). As the NFCC increases, the effect of Parental Health Behavior on self behavior is strengthened. The effect of Parental Health Behavior for persons who are one standard deviation below the mean on NFCC (2.81) is equal to  $0.10$  ( $p = .28$ ,  $r = .023$ ) whereas the effect of Parental Health Behavior for persons who are one standard deviation above the mean on NFCC (4.39) is equal to  $0.41$  ( $p < .001$ ,  $r = .090$ ) (see Fig. 1). Thus, offspring with high need for cognitive closure tends to replicate parental behaviors in the health domain, thus preserving the family culture across generations.

## Discussion

Results of our first study are consistent with the hypothesis that motivational orientation, and in particular need for closure, affect normative conformity within a family by enhancing the similarity between offspring's and perceived parents' health related behavior. Although these results are encouraging, the study's use of perceptions of parental behavior as a proxy of actual behavior constitutes a serious limitation. Thus, it is possible that high need for cognitive

closure participants simply perceive their parents' behavior as more similar than their low need for closure counterparts without there being any actual similarity in their behaviors. To overcome this limitation, the following two studies examined actual behavioral conformity of newcomers to a group as a function of their need for closure.

## Study 2

Stability of group norms across shifts in membership has received a relatively scant research attention from social psychologists (Kenny et al., 1993; Mesoudi, 2007; Nielsen & Miller, 1997). An important exception is Jacobs and Campbell's (1961) innovative study of cultural transmission across generational changes in membership. These authors used an experimental procedure previously employed by Rose and Felton (1955) using the autokinetic illusion. Specifically, social standards regarding the extent of (illusory) movement exhibited by a point of light are created in the first generation of research participants, and these social standards then become the essential reference point for subsequent generations. The few extant studies of this phenomenon demonstrate that an arbitrary norm may exhibit some stability inversely related to its degree of arbitrariness (Kenny et al., 1993), that is, deviation from members' own inclinations (MacNeil & Sherif, 1981), and effortfulness of maintenance (Weick & Gilfillan, 1971). These findings imply that member motivations (e.g., the desire to follow one's own inclinations or to save effort) may constitute an important underlying factor of cultural stability. In the present research, we assumed that need for closure is a major motivational factor determining both old-timers' stability and newcomers' conformity to group norms. Specifically, the urgency tendency induced by the need for closure may contribute to newcomers' tendency to seize upon the group pre-existing standards. Moreover, also old-timers' permanence tendency enhanced by NFCC may affect their adherence to the group norms and to uphold the group's existing norms across generations.

## Method

### Participants

Participants were 160 females students of psychology at the University of Rome "Sapienza," whose average age was 21.3 ( $SD = 2.4$ ). They were randomly assigned to 20 laboratory micro-cultures (8 naive participants for each micro-culture), 10 for each condition. Half the participants performed the experimental task under noise condition found in prior research to induce the need for closure (Kruglanski & Webster, 1991), and the remaining participants assigned to the control condition performed the same task without noise.

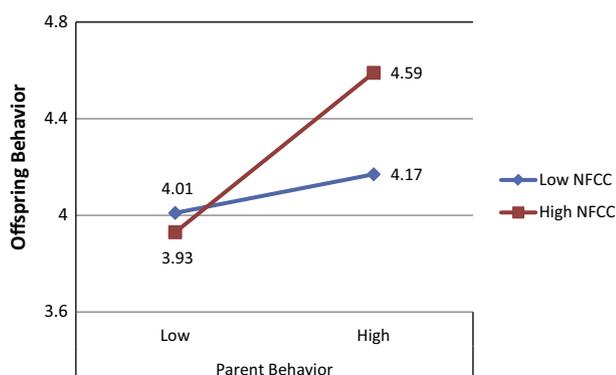
### Procedure

In a mass session, up to two months before the experiment took place, participants completed a small booklet containing various scales. At the end of this booklet, participants were asked to volunteer for a study concerning a group simulation. As the participant pool largely consisted of females, male participants were excluded from the sample. Those individuals who agreed to participate were subsequently contacted by phone and invited to appear at the laboratory of the Department of Social and Developmental Psychology at the University of Rome "Sapienza." Following arrival, all participants (including two female confederates) were greeted by two experimenters and were accompanied to a waiting room close to the Social Psychology Laboratory. One experimenter then explained to participants that they would be called into the experimental room in a random order. In the experimental condition,

**Table 1**  
Moderated regression coefficients.

Predictor	Estimate	Effect size	<i>p</i>
Parents' health behavior	−0.453	−.101	.161
NFCC	−0.655	−.130	.071
Parents' health behavior × NFCC	0.197	.024	.030

Note: the effect size measure is *r* for parents health behavior, *r* for NFCC, and  $f^2$  for the interaction.



**Fig. 1.** Predicted means for the parent behavior ( $-1$  and  $+1$  SD; 3.08 vs. 4.69) and the need for cognitive closure ( $+1$  and  $-1$  SD; 2.81 vs. 4.39).

when participants entered the laboratory, groups performed the task under environmental noise allegedly produced by a broken air conditioning fan and in fact emanating from a small speaker concealed within the air conditioning vent and connected to a computer that ran a file with noise of a broken fan rotor. The experimenter apologized for the noise in the laboratory, and informed the participants that the fan would be repaired next week. The experimenter also offered participants to reschedule their appointment but none chose to do so. Next, the first three “participants,” two of whom were confederates, were invited to follow the first experimenter to the laboratory. The second experimenter stayed with the remaining participants to ensure that they would not actively socialize with each other. In order to occupy them otherwise he offered them magazines and newspapers.

In the experiment proper, three-person groups participated in a generational procedure in which at the end of each cycle an old member was dropped from the group and a new one was added. The group task was a modified version of the one used by Kenny et al., (1993). Specifically, one naïve participant and two confederates were assembled to form a fictitious company called Caesar Soft Inc. They were informed that the company just issued a new product, a computerized software for language recognition. Participants’ task was to meet as a group and to decide two different issues: mean age and monthly income of the target users of the software.

Each member of the group in turn, stated a numeric opinion regarding each of the two questions. For statistical reasons related to the method of data analysis, no discussion between members took place. After all members verbally stated their opinion on each of the questions, the experimenter informed the group of their decision consisting of the arithmetic mean of the members’ estimates. The two confederates first stated opinions toward the low end of the response scale for each issue (according to pretest), namely 20 and 21 for the age and 880 and 980 euros for the monthly income.

Following the group decision, one confederate left the room, and was replaced by a new naïve participant. The group decision process was repeated and the second confederate was then replaced by a naïve participant. At the end of each cycle, when the participant returned to the waiting room, the second experimenter gave her the post-experimental questionnaire that included the manipulation checks designed to test whether the noise environment was perceived as more noisy and whether the noise affected the activation of the need for cognitive closure (see Webster & Kruglanski, 1994).<sup>1</sup> Six subsequent generational-cycles were run with naïve participants exclusively. Only data from those trials were analyzed. Each set of eight generations (two with confederates, and six without) are referred as a culture (see Table 2). Note that there were eight naïve participants in each culture.

In the experimental condition, groups performed the task under environmental noise, whereas in the control condition they completed the same task in a silent environment.

**Table 2**  
Generations design paradigm.

	1 (c)	2 (c)	Participants								
			3	4	5	6	7	8	9	10	
1	A	B	C								
2		A	B	C							
3			A	B	C						
4				A		C					
5					A	B	C				
6						A	B	C			
7							A	B	C		
8								A	B	C	C

Legend: (c) confederates.

### Procedure and data analysis

The basic datum for our analysis was each participant’s numeric opinion concerning the two decision issues (target mean age and mean income) comprising the experimental task. The data analysis used GENERAL software (GENERations anALysis, Kenny, 1991), aimed to estimate both stability and conformity coefficients from data collected with the generation design (for a detailed description, see Kenny et al., 1993). In the GENERAL model, a separate regression equation is estimated for each of the three members, A, B, and C where A is the most senior member of the group and C is the newcomer. For B and C, one of the predictors is the member’s response in the previous generation and is referred to as the *stability* parameter. Additionally, a person’s behavior is influenced by other members of the group who have responded before the person and this is referred to as the *conformity* parameter. For newcomers, the conformity parameter refers to influence exerted by the other two old members of the current generation, i.e., the average of the two old members’ responses. For the oldest member, the conformity coefficient reflects the influence of only (the answer of) the newcomer of the previous generation whereas the “younger” old member is influenced by (the answer of) the older member of the current generation.

The conformity coefficient presumes that responses occur in a fixed sequence so that the direction of the influence is clear (i.e., older member influence new members and not vice versa). For this reason, no discussion was permitted during each generation; otherwise, participants could influence each other and the analysis model would have become excessively complicated due to this mutual influence. The regression coefficients measure the extent to which a person is *conformist* (i.e., influenced by others) or *stable* (i.e., influenced by the person’s own past) (Kenny et al., 1993). Thus, the score of a member is the outcome variable in a regression equation where the predictor variables are first the member’s prior response from the previous generation (except for the newcomer C) for *stability* and the predictor for C is the average of the responses of the other group members  $[(A + B)/2]$  and for A and B, conformity reflects the influence of the prior response (C from the past generation for A and A from the current generation for B).

The regression stability and conformity coefficients for this model can be estimated for each pair of adjacent generations for a total of  $g - 1$  regression coefficients where  $g$  is the number of generations. Because  $g$  is six for the current study, the stability and conformity values are the average across the five estimates.

To obtain significance tests of these averages, we used bootstrapping (Rodgers, 1999) to obtain  $p$  values in this non-standard case. Bootstrapping has become a popular method for developing sampling distributions for difficult problems (e.g., testing the indirect effects in mediation analyses). The method involves redoing the analysis with randomly re-sampling cultures with replacement. It is then possible to estimate an empirically based sampling distribution to determine the  $p$  value.

<sup>1</sup> To check for environmental noise difference from the control condition at the end of the experiment a short questionnaire apparently distributed for the assessment of general environments characteristics with a 9-point semantic differential such as hot/cool, comfortable/uncomfortable, large/small, and among them, silent/noisy. Results show that manipulated environment was perceived as significantly more noisy than control condition ( $M = 1.8$  vs.  $6.0$ ;  $F(1, 158) = 51.8$ ,  $p < .001$ ). Moreover, to control that the effect of noise did not affect the individual general activation (Kruglanski & Webster, 1991), a subscale of General Activation-Deactivation Adjective Checklist (Thayer, 1967) was assessed consisting of 5 items (dynamic, energetic, vigorous, active and lively) with seven points, with Cronbach’s alpha equal to .80. As expected, in this case no differences were found ( $M = 5.5$  vs.  $5.2$ ;  $F(1, 158) = 0.56$ ; n.s.) between the two conditions.

**Table 3**  
Conformity and stability coefficients of the study 2.

Variable	Answer rank	Control condition		Noise condition	
		Conformity	Stability	Conformity	Stability
Age	A	−0.09	0.96 <sup>*</sup>	0.02	0.95 <sup>*</sup>
	B	0.09	0.79 <sup>*</sup>	0.15	0.75 <sup>*</sup>
	C (newcomer)	0.41	–	0.71 <sup>*</sup>	–
Income	A	0.12	1.02 <sup>*</sup>	0.22	0.70 <sup>*</sup>
	B	−0.02	0.94 <sup>*</sup>	−0.01	0.93 <sup>*</sup>
	C (newcomer)	0.60 <sup>*</sup>	–	0.86 <sup>*</sup>	–

<sup>\*</sup>  $p < .05$ .

## Results

Table 3 presents the conformity and stability coefficients for the present study. For the Age variable, stability coefficients for old-timers are high and statistically significant both in the noise and no-noise conditions. These results imply that people generally do not change their responses to this question much from one generation to another and opinions remain relatively frozen. Moreover, for old-timers, the conformity effects are small and not significant. However, differences do appear in the conformity behavior of newcomers: In the no noise condition, conformity coefficient is low and not statistically significant (0.41), whereas in the noise condition it is considerably higher and significant (0.71). This difference between conditions, though in the predicted direction, is not statistically significant ( $p = .45$ ).

For Income, perceived to constitute the more difficult estimation task for participants, the stability coefficients are fairly similar and large for both old members, as well as the conformity coefficients being small and non-significant. Looking at the level of conformity, results show generally higher coefficients than those regarding the Age variable, confirming prior results of Kenny and colleagues with regard to arbitrary tasks as more sensitive to social pressure (Kenny et al., 1993; MacNeil & Sherif, 1981). Whereas no appreciable differential effect was found for old members' conformity coefficients (which are again low and non-significant), while for the newcomers, as with the Age variable, the noise (vs. no noise) variable yielded higher coefficients (0.60 vs. 0.86, both significant). However, this difference between coefficient though in the predicted direction is not statistically significant ( $p = .13$ ). Again, for the income variable, the newcomers appear to adopt the group's norm to a greater extent in the noise condition than in the no-noise condition.

## Discussion

Results of our second study are consistent with our hypothesis although not significant. We expected that individuals would exhibit a greater degree of conformity under noise because of the higher degree of the need for closure that noise is known to induce (Kruglanski, 2004; Kruglanski & Webster, 1996). Indeed in the present study the newcomers conformed more to the group norm in the noise versus the no noise condition and did it with regard to both the easier estimation question concerning the age of potential users and the more difficult estimation question concerning their income. However, although again encouraging the present results are open to an alternative interpretation, namely that the greater conformity of members in the noise (vs. no noise) condition was simply due to the difficulty of thinking independently under noise. To address this issue, our second study measured participants' need for closure rather than manipulating it via noise. Should our findings replicate under these conditions, this would yield further evidence that the greater conformity of newcomers, contributing to

transgenerational norm transmission, is affected in the predicted manner by group members' need for cognitive closure.

## Study 3

### Participants, procedure, and task

In order to have a stronger variation in NFCC, we select 80 participants from the first tercile (High NFCC) and 80 participants from the third tercile (low NFCC) from a larger pool of participants collected in two mass testing sessions a few months prior to the experiment proper. All participants were psychology students at the University of Rome "Sapienza," who responded in that session to the Italian version of the Need for Closure scale (Webster & Kruglanski, 1994). Following prior research (Mannetti et al., 2002), in the present study we used a short version of the NFCC scale without the Decisiveness items. Using their scores on the scale, participants were then divided into three need for closure groups: low, middle, and high, but only low and high participants were used in this study. A total of 160 female participants, whose average age was 22.8 (SD = 2.8), were then contacted by phone and asked to volunteer for a study concerning a group simulation: Those agreeing were invited to the laboratory of the Department of Social and Developmental Psychology. The procedure for the study was identical to the procedure of the first study, except for the fact that all participants were now in the no-noise condition and each group consisted of either of all high NFCC members or low. Participants were assigned into 20 laboratory micro-cultures (8 naive participants for each micro-culture), ten for High on NFCC scale score and ten for Low NFCC.

### Measures

#### Need for closure

The Need for Cognitive Closure NFCC scale by Webster and Kruglanski (1994) was administered in its Italian version (Pierro et al., 1995) as in the first study. The reliability of the scale was satisfactory (Cronbach  $\alpha = .86$ ). An overall score was computed and used to divide participants into high and low groups in the need for closure.

## Results

The conformity and stability coefficients shown in Table 4 replicate those reported in the previous study. Looking first at Age variable, stability coefficients are both high and significant in the two NFCC conditions. Resembling Study 1, while no appreciable differential effect was found for old members' stability coefficients, that are all high and significant, and conformity coefficients, which are small and non-significant, the effect of newcomers' stability is different among the two conditions: for Low NFCC condition, conformity coefficient of newcomers is 0.46 while in High NFCC condition

**Table 4**  
Conformity and stability coefficients of the study 3.

Variable	Answer rank	Low NFCC		High NFCC	
		Conformity	Stability	Conformity	Stability
Age	A	0.06	0.85 <sup>*</sup>	0.04	0.77 <sup>*</sup>
	B	0.11	0.91 <sup>*</sup>	−0.11	1.05 <sup>*</sup>
	C (newcomer)	0.46 <sup>*</sup>	–	0.72 <sup>*</sup>	–
Income	A	0.07	0.88 <sup>*</sup>	−0.08	1.03 <sup>*</sup>
	B	−0.07	0.97 <sup>*</sup>	0.06	0.91 <sup>*</sup>
	C (newcomer)	0.64 <sup>*</sup>	–	0.82 <sup>*</sup>	–

<sup>\*</sup>  $p < .05$ .

it is 0.72. However, this difference is not statistically significant ( $p = .21$ ). These results suggest that participants with high NFCC scores are more conforming to the group norm than participants with low NFCC score. The Income variable shows the same pattern, indicating an increase in conforming behavior from Low to High NFCC (0.64 vs. 0.82). Again this difference is not statistically significant ( $p = .49$ ).

**Discussion**

Results of our third study replicate those of its predecessor. Again, it is found that newcomers under high need for closure (as measured in Study 1 and manipulated in Study 2) show a tendency to conform to the old-timers more than newcomers under low need for closure. The fact that a trait measure of the need for closure behaved in the same way as a situational induction of this variable adds confidence that the latter indeed manipulated a motivational state rather than merely creating a difficulty for independent thinking that promoted conformity to others' opinions and estimates.

*Pooled analysis of studies 2 and 3*

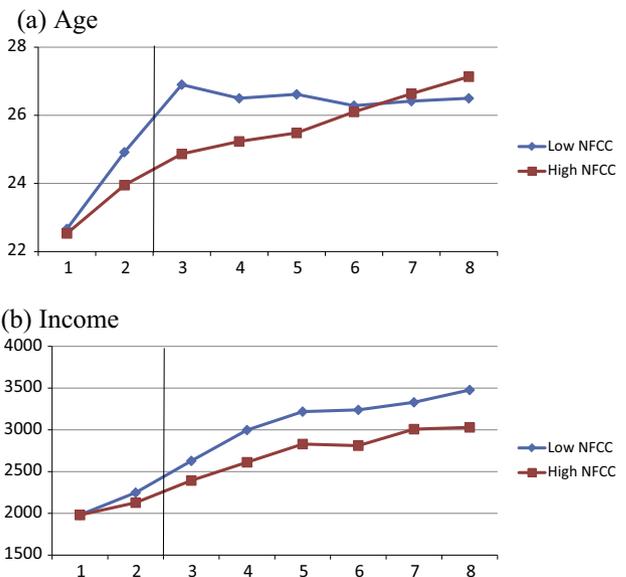
Our two experimental studies have behaviorally confirmed the perceptual results of study 1: Individuals with a high (chronic or momentary) versus low NFC tend to conform more to the judgments of old-timers thus preserving the group culture across generations. Furthermore, consistent with prior research (Kenny et al., 1993), our experimental studies yielded high stability coefficients overall attesting that behavioral consistency is the default option preferred by participants. It appears that newcomers to the group who are high (vs. low) in NFCC (whether dispositionally or situationally) adapt to the group norm and remain firm in their convictions. These results constitute the most direct and straightforward indicator yet of the “seizing effect” postulated by the NFCC theory (Kruglanski, 2004; Kruglanski & Webster, 1996).

To investigate whether the differences between High and Low NFCC in the experimental studies were not due to chance, we tested these effects by pooling across the two outcomes, age and income, and across the two studies. Because the predictors of each outcome are in the same units as the outcome, the estimates from the two outcomes can be combined. To meta-analytically combine the results across our two experimental studies, we used the Stouffer method of combining Zs to obtain a combined  $p$  value (Mosteller & Bush, 1954). We find, for conformity of newcomers, that the difference between the coefficients in the high vs. low NFC conditions is marginally significant (0.78 for High NFCC vs. 0.53,  $p = .065$ ). We note that this marginally significant is in the predicted direction which confirms our main hypothesis. We also note that both conformity and stability coefficients of old-timers are non-significant (see Table 5).

Moreover, we tested the effect of NFCC on overall adherence to norms as indicated by both conformity and stability coefficients.

**Table 5**  
Study 2 (noise vs. control condition) and study 3 (High vs. Low dispositional NFCC) averaged results of the difference between conformity and stability coefficients for age and income in the NFC conditions.

Answer rank	Conformity			Stability		
	Low NFCC	High NFCC	$p$	Low NFCC	High NFCC	$p$
A	.04	.05	.51	.93	.87	.92
B	.06	.02	.99	.90	.91	.74
C (newcomer)	.53	.78	.07	–	–	–



**Fig. 2.** Means of age (a) and income (b) for high and low need for cognitive closure in the eight generations (from the third no confederate was present).

Hence, we tracked the change of group norms across the generations, by both computing the mean and standard deviation for each cultures at each generation. We then standardized within each generation and then averaged across the two outcomes. Moreover, because initial norms once reached are maintained and stabilized by cultures, a second and clearer consequence of NFCC should be lower variation within cultures for high NFCC cultures due to the heightened desire for group uniformity and clarity (Pierro, Mannetti, De Grada, Livi, & Kruglanski, 2003).

Therefore, using the forty cultures as unit of analysis, first we standardized the mean and standard deviation for each generation both for income and age within each of the six generations (see Fig. 2 and Table 6 for raw data); we then averaged these standardized values of age and income for each generation in order to obtain a pooled value for means and standard deviations. Next we submitted the generations' standardized mean and standard deviations values to two repeated measures ANOVA based on the general linear model (GLM) analysis, with the six generations (excluding the first two where confederates are present) of means and standard deviations (as a within culture variable), and NFCC (high vs. low) as a between-subject variable.<sup>2</sup> For the analysis of the means, results show that whereas the generations effect is non-significant the NFCC effect is marginally significant ( $F(1,38) = 2.91, p < .10$ ). Expected marginal means show that high NFCC cultures have lower standardized values, suggesting that high NFCC cultures' means are closer to initial norms (High NFCC  $M = -0.143$ ; Low NFCC  $M = 0.143$ ).

Interesting results also emerged from the analysis of standard deviations within each generation: Here again no effect was found for generations, or for the interaction between NFCC and generations, but the NFCC effect was significant ( $F(1,38) = 8.28, p < .01$ ): As expected, high NFCC cultures have lower standardized values, indicating that NFCC cultures under need for cognitive closure exhibit lower intra generational variation (High NFCC  $M = -0.19$ ; Low NFCC  $M = 0.19$ ).

<sup>2</sup> In order to check the interaction effect of the kind of manipulation by NFCC, preliminarily the same analysis was run adding “study” as between factor variable (noise vs. dispositional manipulation). Results show no significant results both for mean and for standard deviations and thus this variable was not included in the subsequent analysis.

**Table 6**

Means and standard deviation for each generation of age and income for high and low need for cognitive closure for the eight generations (from the third no confederate was present) from the two experimental studies.

Generations	Mean of each generation								Standard deviation of each generation							
	Age				Income				Age				Income			
	Low NFCC		High NFCC		Low NFCC		High NFCC		Low NFCC		High NFCC		Low NFCC		High NFCC	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
1	22.67	1.77	22.53	2.01	1982	284	1981	270	4.06	2.67	3.80	3.21	383	449	370	433
2	24.92	3.66	23.95	2.90	2248	340	2128	431	4.50	2.96	3.43	2.47	529	455	391	377
3	26.90	4.69	24.87	2.78	2628	709	2393	589	3.73	2.06	2.27	.93	671	594	415	271
4	26.50	4.83	25.23	2.76	2998	941	2612	694	2.97	2.16	2.51	1.22	1043	1256	547	421
5	26.62	4.25	25.48	3.00	3218	1223	2830	772	3.15	2.23	1.98	1.19	962	1080	581	318
6	26.28	3.85	26.10	3.17	3239	1181	2811	638	3.49	2.06	2.54	3.07	735	618	507	386
7	26.42	2.88	26.63	3.26	3330	1025	3008	762	3.85	2.03	3.42	2.65	681	400	595	509
8	26.50	2.67	27.13	4.22	3478	1033	3030	731	3.06	1.37	3.06	1.82	631	434	581	462

## General discussion

In summary, both experimental and naturalistic studies described in this paper attested to the effect of need for cognitive closure on the stability of transmission of cultural norms. In particular, it was found as in cultures with high need for cognitive closure, the norms' stability is fostered by the urgency tendency, that leads newcomers to seize upon the group standards; accordingly, groups composed of high need for closure individuals exhibited greater cultural stability than groups composed of low NFCC. The first study showed that in families where child are high on the need for closure, the offspring seems to be more attuned to prior traditions, and assimilate to them thus passing the family cultures from one generation to another contributing. The pooled analysis of the subsequent two experimental studies demonstrated the effects of NFCC on cultural stability and attested to relatively low intra-cultural variability identifying the basic mechanism through which this stability is guaranteed. More specifically, our results imply that cultural resistance to change is promoted by the process of seizing through conformity of newcomers more so than by the behavioral stability of the old-timers: newcomers with high (versus low) need for closure tend to be more conformist to groups norms expressed by old-timers and to seize upon those norm, whereas no differences between high and low need for closure individuals were found in the maintenance of such norms. As a consequence, cultures under need for closure showed higher tendency to be anchored to older generation's norm but also exhibited a lower behavioral variation within generations manifesting opinion uniformity characteristic of group centrism (Kruglanski et al., 2006).

Findings from our studies were conceptually consistent with our theoretical derivation concerning the positive relation between need for closure and the stability of cultures. In fact, previous study on relationship between need for closure and acculturation process (Kosic, Kruglanski, Pierro, & Mannetti, 2004) showed a similar effect demonstrating that immigrants with high need for closure prefer to assimilate to the host or their native culture whichever seems to be more accessible in given circumstances. Hence reference group culture (native or host) helps to reduce epistemic ambiguity and confer security (Chao & Chiu, 2011). Consistent with this idea Tam, Lee, Kim, Li, and Chao (2012) found that perceived normative values are stronger determinants of socialization values among parents with a stronger need for closure. In the same way our research suggests that the need for closure contributes to cultural stability via increasing the conformity of newcomers, through the seizing tendency heightened by NFCC, as this motivation helps to urgently reach a sense of shared reality and hence attain confident closure.

Although each of the studies in separation from the others contains potential flaws, taken as a whole they provide consistent sup-

port for the hypothesis that members need for closure is positively related to the transmission of group culture across generations. Both Study 2 and Study 3, created a somewhat artificial situation where no discussion among group members was allowed. This problem does not exist in Study 1 where everyday similarity between parent and child behaviors has been addressed. However, the latter study is open to the objection that it addressed the offspring's perception of their parents rather than the attitudes of the parents as such. Nevertheless, cultural conformity relies on perceived group norms rather than actual or real attitudes of parents that might not be available to the offspring.

Results show also that for old-timers the *stability* coefficients are generally very high whereas, contrary to the newcomers' findings, old timers' conformity coefficients are rather low in both our laboratory studies. This evidence replicates previous studies of Kenny and colleagues (Kenny et al., 1993) showing that stability is high regardless of group size (both in dyads or four members' group) as a kind of ceiling effect. Hence, it seems that participants default option as newcomers is to conform or not (in our case determined by their need for closure). In contrast, by the time participants become old-timers their default option seems to be personally coherent and consistent in their evaluations (Ledgerwood, Trope, & Chaiken, 2010). Therefore, old-timers do not conform to the other members of the group because of their tendency magnified under a high need for closure to "freeze" on the familiar group norms and not pay attention to further information. Future experimental studies should decrease the stability effect with a more direct manipulation that increases the costs of cognitive closure, such as accountability (Kruglanski, 2004). Moreover, future studies may explore a more direct effect of NFCC on norms transmission in groups assessing directly the behaviors of both parents and children.

Considered collectively then, the present studies offer consistent, but preliminary evidence linking the need for closure and cultural stability of groups across generations. Overall, our results cohere with a growing body of data concerning the effects of the Need for Cognitive Closure on the maintenance of homogeneous and stable social reality. For example, prior studies (e.g., Doherty, 1998; Kruglanski & Webster, 1991), found that need for cognitive closure increases members tendency to reject individuals who express deviant opinions presumably in order to find a stable and shared reality within the group (Harding & Higgins, 1996). Other studies demonstrated that under high NFCC there emerges a strong preference for homogenous values and attitudes within the group, as well as the tendency to seek autocratic leaders, who are perceived as capable of cultivating a desired uniformity and clarity (Pierro et al., 2003) and a strong motivation to seek understanding and attunement to social norms (Bechtoldt et al., 2010; De Dreu et al., 2008; De Grada, Mannetti, Pierro, Kruglanski, & Livi, 2004).

It is thus possible that at times of a heightened uncertainty within families or nations (such as during famines, economic or political crises, and other unsettling events) a behavioral syndrome may emerge described by Kruglanski et al. (2006) as group-centrism, a pattern that includes pressures to opinion uniformity, encouragement of autocratic leadership, in-group favoritism, rejection of deviates, resistance to change, conservatism, and the perpetuation of group norms.

In summary, the present studies suggest that members under high need for cognitive closure may contribute to the stability of group norms across generations, primarily through the tendency of newcomers to conform to old-timers attitudes and opinions. Subsequent work may probe more specifically the processes and mechanisms whereby newcomers' conformity is encouraged and the ways in which old-timers may contribute by exerting pressures on the newcomers (whether explicitly or implicitly) and making contingent their approval and acceptance into the group on their acceptance of group norms and traditions.

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