Driving and Hindering Forces in Group discussions: Analyzing Change and Sustain Talk in a Software Engineering Project

Hilko F. K. Paulsen[1], Florian E. Klonek[1], Annika Meinnecke[1], Kurt Schneider[2], Olga Liskin[2], & Simone Kauffeld[1]
[1]Technische Universität Braunschweig | Institute of Psychology | Dep. of Industrial/Organizational and Social Psychology
[2] Leibniz Universität Hannover| FG Software Engineering

- Software projects often depend on cooperative team work and are likely to fail if participating engineers are not willing to work on the same solution (cf. Hoegel & Parboteeah, 2006). According to Lewin (1952) these interpersonal conflicts can also be expressed in terms of driving and hindering forces.
- In order to investigate the impact of this social psychology construct we propose to operationalize driving and hindering forces by means of individual change and sustain talk (cf., Amrhein et al.,2003; Klonek, Ianiro, Kauffeld, 2013) In our study, we measured the individual language parameters of 65 participants (in 13 teams) during an early meeting of a software engineering project.
- We show that decoding change-related language provides a tool similar to force-field analysis (Lewin,1952) which can reveal interpersonal driving and hindering forces in team discussions. Further, it allows detecting ambivalences within individuals.

Method

- In our study, we measured the individual language parameters of 65 participants (in 13 teams) during an early meeting of a software engineering project. The participants took part in a six-months-course that simulated an industry project.
- Video taped discussions were coded with a German version of the Motivational Interviewing Skill for group discussions (MISC 2.1, cf. Klonek & Kauffeld, 2012). Coding was performed by using INTERACT software (Mangold, 2010); two videos were coded twice by two trained raters with an interrater-reliability of K=.55.
- Overall team performance was assessed with a 5-point single-item (“The team meets its quantitative and qualitative goals.”; 1 *strongly disagree* to 5 *strongly agree*) adapted from Kirkman and Rosen (1999) by two raters (*ICC*=.76*).*

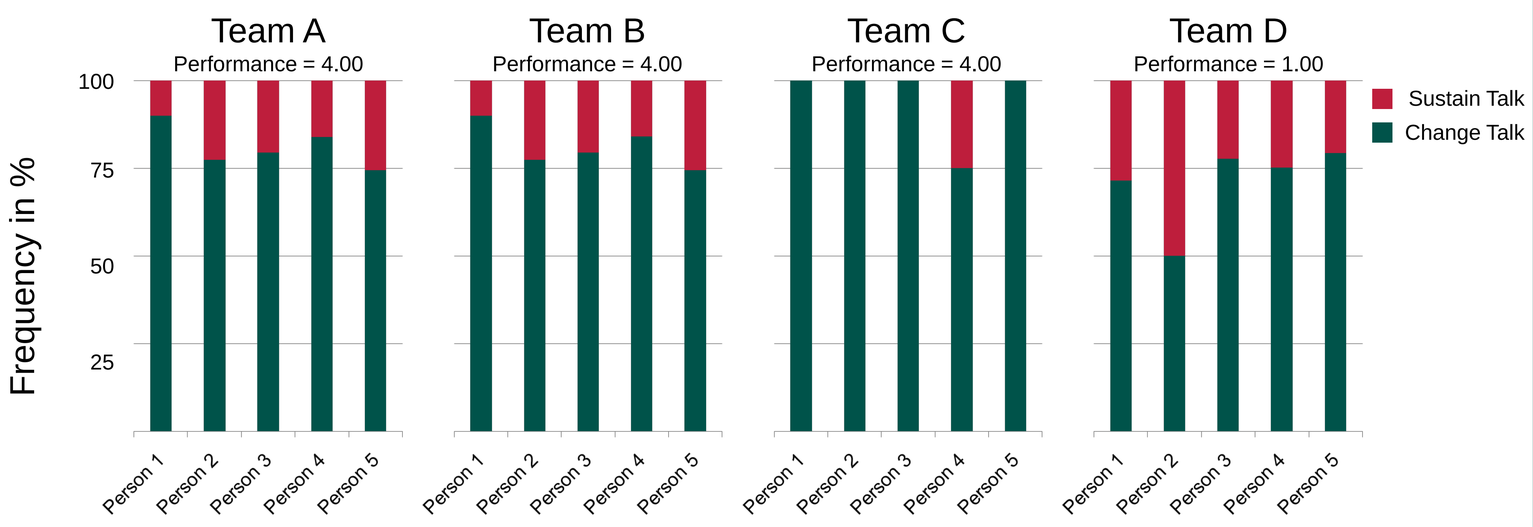
Table 1 – Coding shema (cf. Klonek & Kauffeld, 2012)

Change Talk (+)/Sustain Talk (-)
Reasons (G/g) “We should…” (arguments for and against change)
Desire (W/w) “I want to…”; “I’d like to…”; “I love to…”
Ability (F/f) “I can”; “We are able to…”
Need (N/n) “I need”; „We must“
Activation (A/a) Member movement towards or away from change that is not captured by the other categories
Taking steps (S/s) Concrete and specific steps towards or away from a target behavior associated with change
Commitment (V/v) Agreements; intention to change; obligations
Neutral
Giving Information (I), Closed Question (c) Open Question (o)

Preliminary Results

- Results from four teams with an average discussion length of 43:18 minutes (*SD*=19:42 minutes) are presented in Figure 1. The average frequency of Change Talk across groups was 167 (*SD*=112.40), while the average frequency of Sustain Talk was 43 (*SD*=38.00).
- In order to compare language parameters from different teams, we standardized all codes to a 1-hr period. Participants expressed significantly more Change Talk than Sustain Talk (*t*(19)=4.31; p<.001). Interestingly, in the underperforming Team D the percentage of Change Talk [Change Talk/(Change Talk + Sustain Talk)] was smaller than in the other three teams (75.87 % vs. 84.16 %).

Figure 1 – Percentage Change Talk (%CT) and Sustain Talk (%ST)



Note: Percentage Change Talk is calculated by dividing Change Talk by the sum of Change Talk and Sustain Talk

Further Research

- In this study the amount of Change Talk is higher than the amount of Sustain Talk indicating that teams are in an action-phase (cf. Prochaska & DiClemente, 1984). We assume that in later project phases, this ratio may change.
- The link between interaction behavior and team perfomance should be studied with a larger sample (cf. Kauffeld & Lehmann-Willenbrock, 2012).
- Sequential analysis (Bakeman & Quera, 2011) may help to identify whether single Sustain Talk statements faciltate subsequent ideas or interrupt an idea flow (cf. Sonalkar et al. 2013).
- Sequential Analysis (Bakeman & Quera, 2011) can also reveal phases of conflicts in which members exchange in Change Talk – Sustain Talk patterns.

References:
Amrhein, P. C., Miller, W. R., Yahne, C. E., Palmer, M., & Fulcher, L. (2003). Client commitment language during motivational interviewing predicts drug use outcomes. *Journal of Consulting and Clinical Psychology*, 71, 862–878. doi:10.1037/0022-006X.71.5.862
Bakeman, R., & Quera, V. (2011). Sequential analysis and observational methods for the behavioral sciences. Cambridge, New York: Cambridge University Press.
Hoegl, M. & P.Parboteeah. (2006). Autonomy and teamwork in innovative projects. *Human Resource Management*, *45*,1 67–79.
Kauffeld, S. & Lehmann-Willenbrock, N. (2012). Meetings matter: Effects of team meetings on team and organizational success. *Small Group Research, 43*, 130-158. doi:10.1177/1046496411429599
Kirkman, B. L., & Rosen, B. (1999). Beyond self-management: Antecedents and consequences of team empowerment. Academy of Management Journal, 42(1), 58–74. doi:10.2307/256874
Klonek, F.E., Ianiro, P., Kauffeld, S. (2013). Should I stay or should I go? When verbal interactions in change projects clash. Manuscript submitted for publication.
Klonek, F. & Kauffeld, S. (2012). *Sustainability goes Change Talk: Can Motivational Interviewing be used to increase pro-environmental behavior?* Proceedings of Measuring Behaviour 2012, 8th International Conference on Methods and Techniques in Behaviroual Research, Utrecht, The Netherlands, August 28-31, 2012.
Lewin, K. (1952). *Field theory in social science: Selected theoretical papers.* London: Tavistock.
Mangold. (2010). INTERACT Quick Start Manual V2.4: Mangold International GmbH. Retrieved from www.mangold-international.com
Prochaska, J. and C. DiClemente (1984). *The transtheoretical approach: Crossing traditional boundaries of therapy.* Homewood, Ill., Dow Jones-Irwin.
Sonalkar, N., Mabogunje, A. & Leifer, L. (2013): Developing a visual representation to characterize moment-to-moment concept generation in design teams, *International Journal of Design Creativity and Innovation*, *1*, 93-108. doi: 10.1080/21650349.2013.773117

Technische Universität Braunschweig

Institute of Psychology
Department of Industrial/Organizational and Social Psychology