Lean, Psychological Safety, and Behavior-Based Quality: A Focus on People and Value Delivery

Sulyn Gomez¹, Glenn Ballard¹, Paz Arroyo², Cory Hackler², Rodney Spencley², and Iris D. Tommelein¹

¹ Project Production Systems Laboratory (P2SL), UC Berkeley
² DPR Construction
Filling the Gap

Quality, safety, and production issues

- Rework, accidents, delays, cost overruns, and loss of trust

Insufficiently broad perspective on interconnected processes and overreliance on buffering

Influence of human factors in the design and success of construction processes
Trends We See Today

The construction industry, while being highly complex, is moving towards increasing value delivery.

Psychological Safety (P/S): Essential for learning organizations
Psychological Safety Evolution

Schein (1985): P/S as feeling safe in the context of change

Kahn (1990): P/S as being oneself without fear of negative consequences

Edmondson (1990): P/S as a belief for interpersonal risk-taking

Gomez et al. (2019): P/S as a feeling based on assessments

Impact trust and ability to discuss and define expectations, and commit to a well-defined scope

→ Behavior-Based Quality (BBQ)
Research Design

1) Explore theoretical foundations and linkage between Lean, P/S, and BBQ
2) Illustrate findings
   → Interviews, questionnaire, observations
   → Various companies and roles
Lean and Quality

Focus on quality has changed

Conformance to requirements (Crosby 1979)

Uniformity (Deming 1982)

Fitness for use (Juran and Gryna 1988)

No deficiencies (Juran and Godfrey 1999)

Satisfying customer’s conditions of satisfaction (Ballard and Tommelein 2014; Spenceley et al. 2018; LCI 2020)
Lean and Quality

Respect for People

Factory model of management → Simple, controllable employee

A knowledge-intensive world requires people who share concerns, mistakes, and half-formed ideas, speak up with confidence, and ask questions

Language Action Perspective

A prerequisite for reliable promises is that suppliers can say “no” to a request (Ballard and Tommelein 2016)

BBQ requires conversation where expectations are articulated, and shared understanding is achieved
Lean and Quality

Respect for People

It requires each person be helped to develop their capabilities

“you cannot, and should not, fool the people” Crosby (1979)

→ Supports learning and continuous improvement

Language Action Perspective

→ Clarity of requests and commitments are key in the planning process
“top management should publish a resolution that no one will lose their job for contribution to quality and productivity”

People might choose not to speak up, even though consequences can harm the team, in exchange for self-protection

→ unhelpful or unhealthy behaviors

Deming (1986)

Edmondson (2018)
P/S and Quality

P/S and Learning Behaviors

Quality concerns getting clarity on work

P/S and BBQ

In building P/S, it is expected that every member of the team takes ownership of their contribution to achieve quality

If teams are not able to move things from unknown to known, every day will likely have its surprises
→ Reliable promising can be understood as the basic process underlying BBQ, which focuses on people’s behaviors

→ The underlying behaviors for BBQ can be understood as those enabled by psychological safety

→ Clients deserve to know exactly what companies have committed to deliver and must receive exactly that
P/S fosters respect for others and builds environments of mutual, measurable, authentic care where interpersonal risk-taking is welcome.

P/S facilitates active and open participation in process design and ownership of operations.

“bringing in craftspeople allowed us to incorporate their constructability suggestions. In some cases, they suggested solutions that exceeded what we thought they could do ...”
Approaches that focus only on satisfying requirements fail in recognizing:

1) the ability of stakeholder’s leadership to facilitate a process that supports psychological safety, and that
2) plans and specs might not be totally accurate, complete, or might not clearly express client expectations

“that’s only like 3 words in the specs [referring to bench welding details], but that’s the very first thing they went to [architects when reviewing]”
In Practice: P/S in Construction Projects

→ P/S can shape project participants’ interaction and make the difference between:

Getting a common understanding about expectations  
Discovering problems and defects

→ People from different backgrounds get together and collaborate within and among teams in a fast and changing environment

How to foster an environment where this can occur?
Conclusions

→ Lean, P/S, and BBQ: A common pursuit and means to deliver value

→ Lean: Customer as a priority. Construction is a multidisciplinary industry with high dependency among players

→ Lean, P/S, and BBQ: All lead to or require respect for the individuals. With “respect for people,” you see an increase in productivity, higher quality, and more open conversations

→ If teams apply Lean, opening a work environment of P/S where BBQ can flourish, achieving the expected outcomes would be more likely
This research was funded by gifts made to the Project Production Systems Laboratory (P2SL) at UC Berkeley. Any opinions, findings, conclusions, or recommendations expressed in this paper and presentation are those of the authors and do not necessarily reflect those of contributors to P2SL.