Disengagement in Pair Programming: Does It Matter?

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Additions by Lutz Prechelt
Pair Programming

- Two developers
- One computer
- One task
- Shared responsibility

```java
public static void main(String[] args) {
    String message = "Hello World!";
    System.out.println(message);
}
```
Why Pair Programming?

Quality

Knowledge

Communication
How does it work?

“Pair programming works when the pairs are tightly integrated, interacting and working closely.” (Williams and Kessler, 2002)
Developers' interactions

• Collaboration
• Engagement

Quality

Knowledge

Communication
Disengagement

“Let's test the method …”

Not focus on the task, allow the partner to work for herself

? Quality

? Knowledge

? Communication

Lalala lalala
Disengagement

“Let's test the method …”

public static void main(String[] args) {
    String message = "Hello World!";
    System.out.println(message);
}

Lalala lalala
Research focus

1. When do developers disengage in PP sessions?
2. How can disengagement be avoided?
3. Does disengagement matter?

Research approach

In depth qualitative analysis of developers’ interactions
Data Collection

- Questionnaires
- Audio and video recordings of PP sessions
Video of PP sessions
Data Collection

- Questionnaires
- Audio and video recordings of PP sessions
- Interviews with pairs of developers
Data Background

- Industrial settings
- Day to day task
- 21 recorded pair programming sessions (each session between 1 and 3 hours)
- 31 developers
- 4 companies

various application domains
Analysis Steps

1. Identify episodes of disengagement in PP sessions
2. Investigate circumstances leading to disengagement
3. Explore how disengagement in PP sessions can be avoided
Indicators for engagement
- Feedback
- Mirroring
- Question, response
- Contribution
- Intervention

Disengagement

“Let's test the method …”

Absence of engagement
Analysis Step 1

Identify episodes of disengagement in PP sessions

Audio and video recordings of PP sessions

Interviews with pairs of developers
Analysis Step 2

Investigate circumstances leading to disengagement

Audio and video recordings of PP sessions

Interviews with pairs of developers
Analysis Step 3

Explore how disengagement in PP sessions can be avoided

Audio and video recordings of PP sessions

compare similar sessions with and without disengagement
When do developers disengage?

- Interruptions
- Division of work according to expertise
- Simple tasks
- Social pressure
- Time pressure
Pete replies to the co-worker: “I have no idea what you are talking about.”

Co-worker explains what he means and asks: “[…]When do you think it will be ready?”

Pete is pointing to the screen: “I’ll take care of it when we’re done here.”

Co-worker: “Ok.” Then he leaves.

Sandra is still typing: “We do it like this, alright?”

No reaction from Pete, Sandra continues typing in silence. After 40 seconds Sandra stops driving and asks: “Can you continue?”

Pete is taking the mouse and keyboard without starting to type: “I’m completely lost at the moment. Why does he need to bother me with this right now?”
David: “And that is called in Java. So let’s debug it from the Java side because everything else does not make sense.”
Alex: “But I do not know the Java part.”
David is taking the keyboard: “That does not matter. So I take the lead now.”
David starts driving and an episode of disengagement of Alex starts. Later in the session, they face a C++ task while David is still driving. He shifts the keyboard to Alex and says: “Ok, I think I let you do that! Ok?”
“[…] the part where the refactoring started. You could have done that without me. I was just sitting next to you in this situation. There was nothing to think about. […] We did not build anything new [in this situation]. That was just about executing the task.”
When do developers disengage?

- **Interruptions**
- **Division of work according to expertise**
- **Simple tasks**
- **Social pressure**
- **Time pressure**
Expert-Novice Constellations

• Pair Programming experience
• Knowledge transfer
Tom (novice): “I feel like I have to understand it [explanations by his partner] as quickly as possible. So, that we can move on to solving the task and that we get started and”.
Max (expert) interrupts: “In order to not look stupid?”
Tom (novice): “Yes.”
Time pressure

Expert statement
“If we would have had more time and not that much deadline pressure I would have explained the topic to him properly. [...] but we haven’t had the time for that. “
How can disengagement be avoided?

- Encouraging novice to drive
- Asking for clarification
- Verbalisation, explanation and feedback questions
Does disengagement matter?

Acceptable disengagement

Harmful disengagement (conflicting goals)

Visible vs invisible disengagement
Awareness

State of engagement

Motivation for session

Minimizing the risk of harmful disengagement

Developers' interactions

Session planning
public static void
main(String[] args) {
    String message = "Hello World!";
    System.out.println(message);
}

Thank you!

Any questions?