The mere presence of a social partner modulates fake-production costs

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57th Herbsttreffen der experimentellen Kognitionspsychologie (HExKoP)
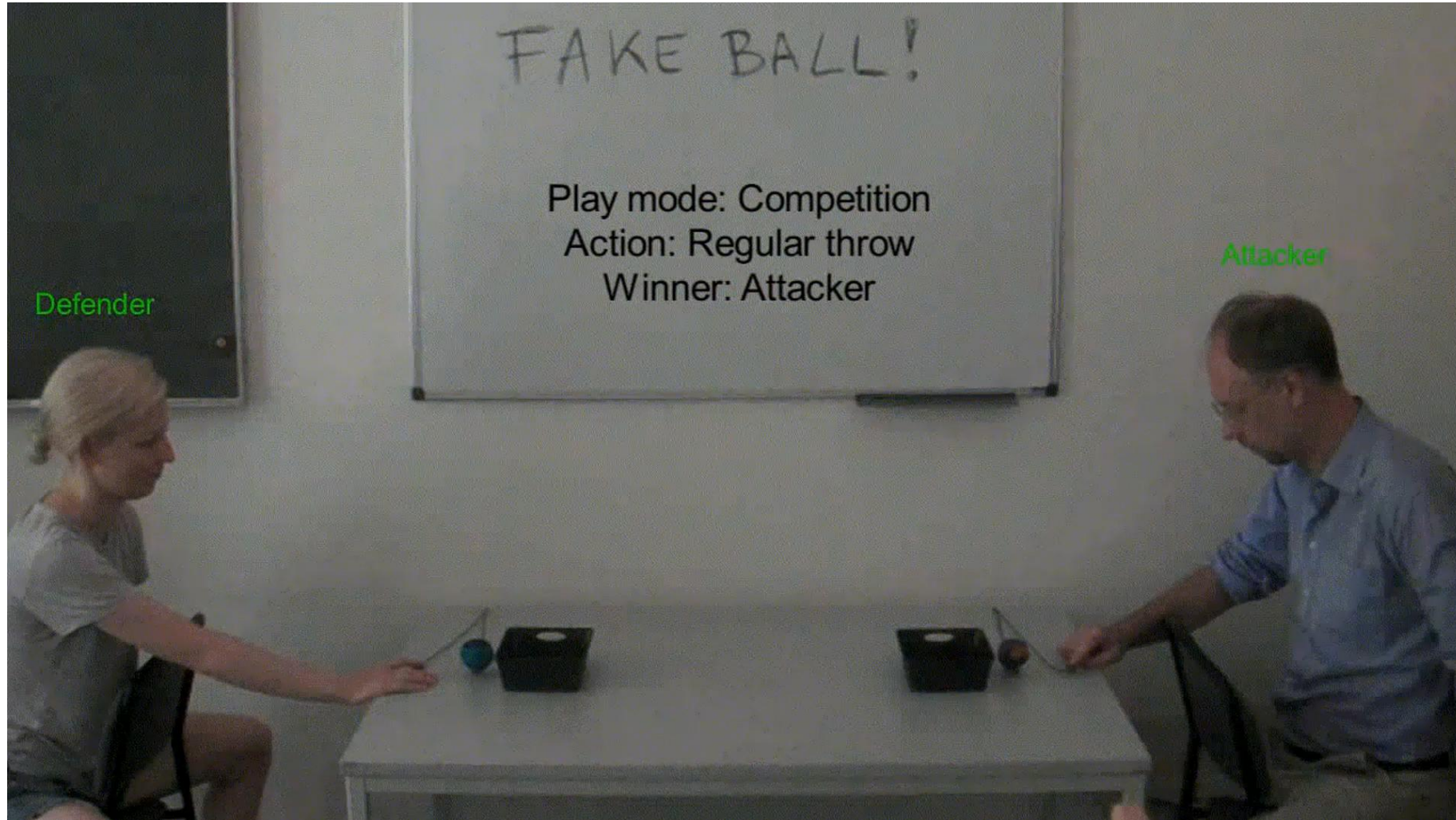
08.10 – 10.10.2025, Trier

- Deceptive actions are used in many competitive sports for example in volleyball, rugby, basketball.

- Many studies investigated the efficiency and boundary conditions of deceptive actions on the side of the observer (for overviews, see: Güldenpenning et al., 2017; Jackson & Cañal-Bruland, 2019).

The cognitive costs of producing deceptive actions in sports have hardly been studied so far (Böer et al., 2024, 2025; Güldenpenning et al., 2023; Kunde et al., 2019; Wood et al., 2017).

Figure taken from: Kunde et al., 2011

Kunde et al. (2019) demonstrated that fake throws require longer initiation times (ITs) compared to regular throws, indicating so-called fake-production costs.

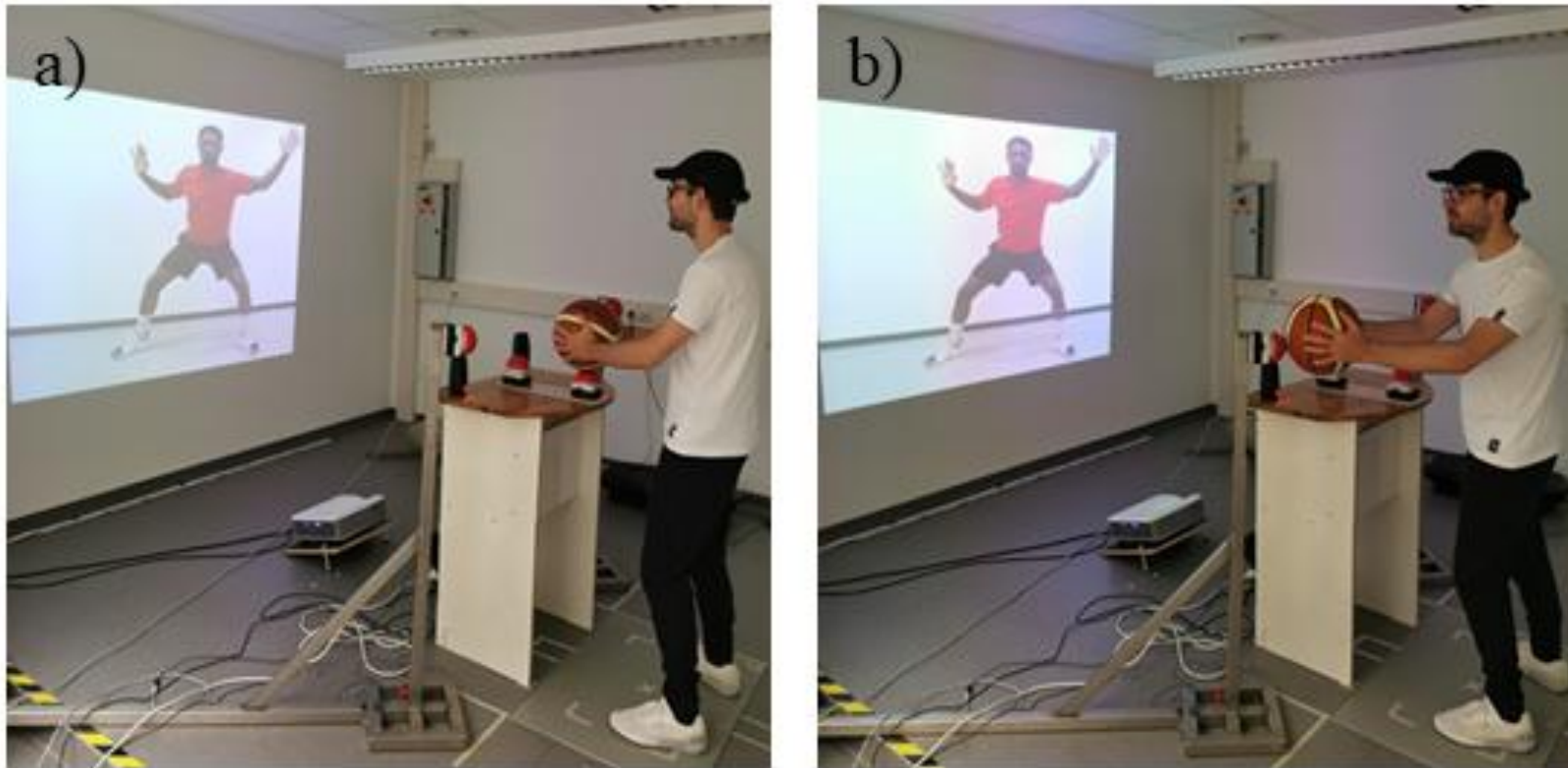Video taken from:
Kunde et al., 2019

Figure taken from: Böer et al. 2024

- Response-Response incompatibility costs arise in the process of response selection (Diedrichsen et al., 2001; Hazeltine, 2005), when generating two (spatially) incompatible body movements (Hazeltine et al., 2003).

- These costs are evident in increased RTs, MTs & ERs (Spijkers et al., 1997).

While R-R incompatibility may explain baseline fake-production costs in isolated lab studies, we propose that deceiving a social partner introduces additional cognitive load:

Social Rule Violation:

- Additional social costs may emerge when producers violate the implicit social rule against deceiving others, creating a cognitive conflict (Foerster et al., 2017, 2019; Pfister et al., 2016; Wirth et al., 2016).

Consequence monitoring:

- The cognitive burden of monitoring the intended consequences of deceptive actions may further increase processing costs, requiring additional attentional resources (Foerster et al., 2023; Wirth et al., 2018).
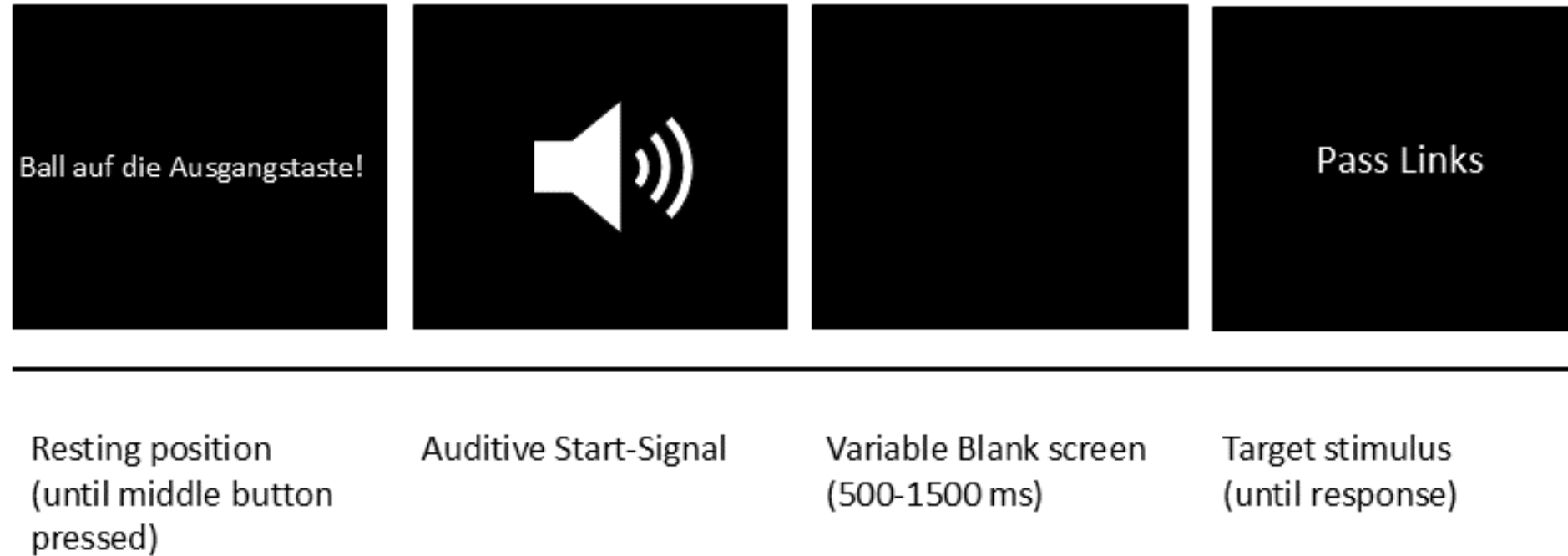
Our study:

- Students participated both in an individual setting without a defender and in a social interaction setting with a defending player.

- We compared ITs, MTs and ERs of the attacking player between a social scenario with a defending player and an individual scenario.

Hypotheses:

1. We predicted to observe fake-production costs when the attacker would play a pass with a head fake, compared to a pass without a head fake.

2. We expected these costs to be higher in the social interaction setting when deceiving a defender, compared to the individual setting.

Participants: 24 novice participants (10 female, M_{age} = 22.1 years, SD = 3.6)

| Ball auf die Ausgangstaste! | 🔊 | | Pass Links |

Resting position (until middle button pressed) — Auditive Start-Signal — Variable Blank screen (500-1500 ms) — Target stimulus (until response)

Procedure:

- 180 Trials each *setting* (individual vs. social interaction): 3 blocks x 60 Trials .
- Trials varied regarding *type of pass* (pass with or without head fake) and direction (left or right).
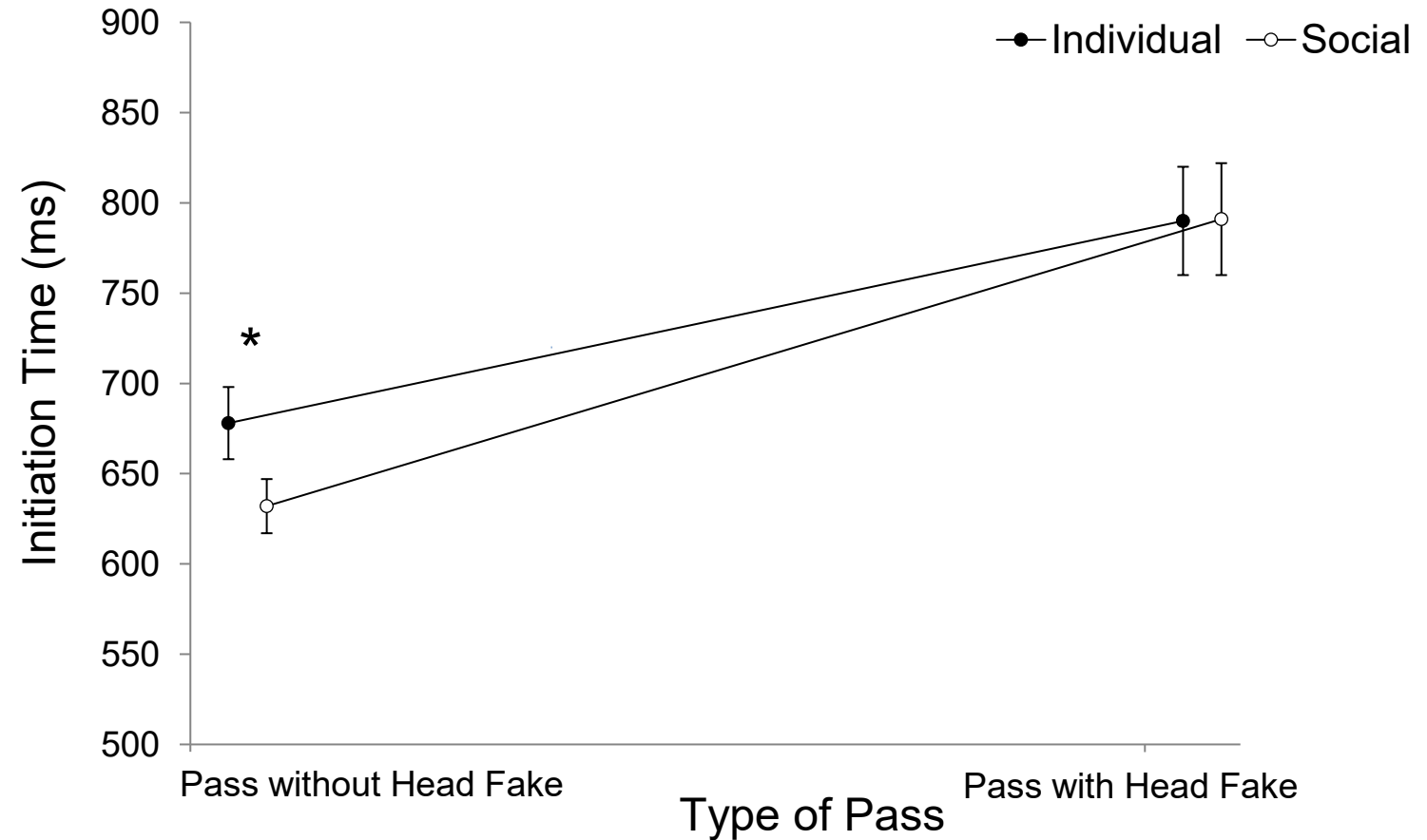- Participants could win 10€ when performing better than their partner in each setting.

ANOVA (type of pass x setting):

Main effect for type of pass:

$F(1, 23) = 66.498$; $p < .001$; $\eta_p^2 = .743$

Interaction type of pass x setting:

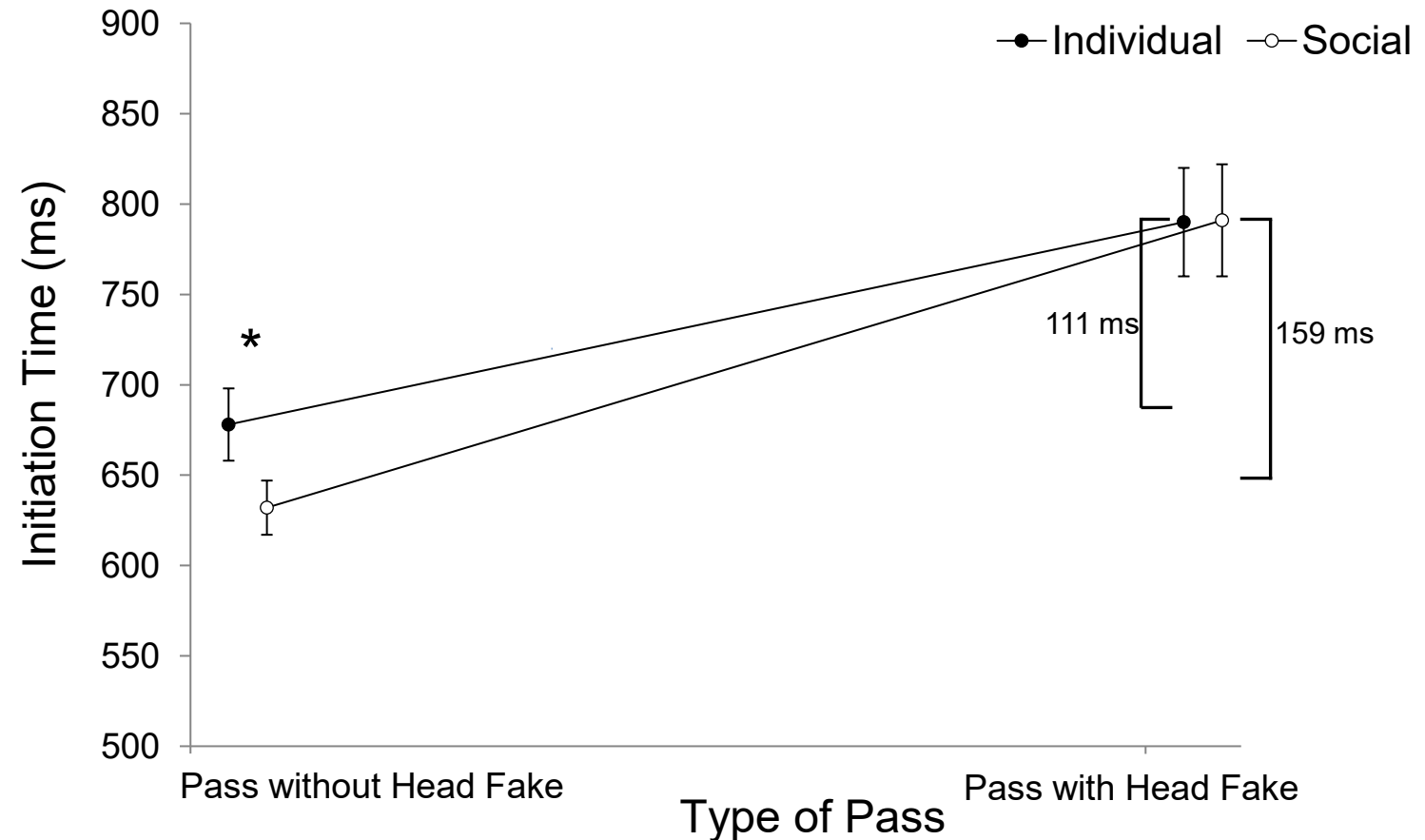$F(1, 23) = 9.041$; $p = .006$; $\eta_p^2 = .282$

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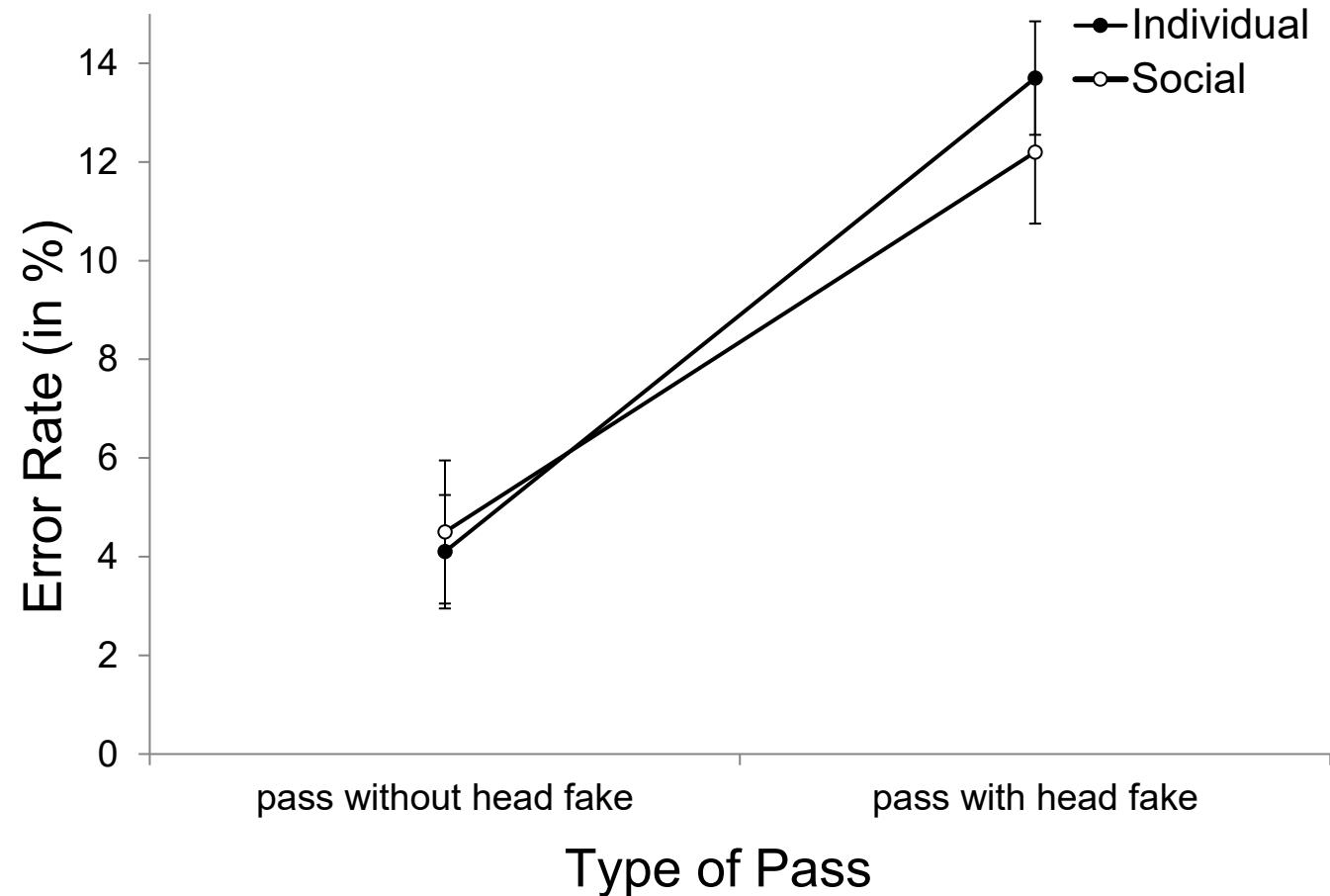$F(1, 23) = 9.041$; $p = .006$; $\eta_p^2 = .282$

- Post-hoc t-test revealed significantly higher fake-production costs in the social setting (159 ms) compared to the individual setting (111 ms), $t(23) = 3.007$, $p = .006$, $d = .614$.

ANOVA (type of pass x setting):

Main effect for type of pass:

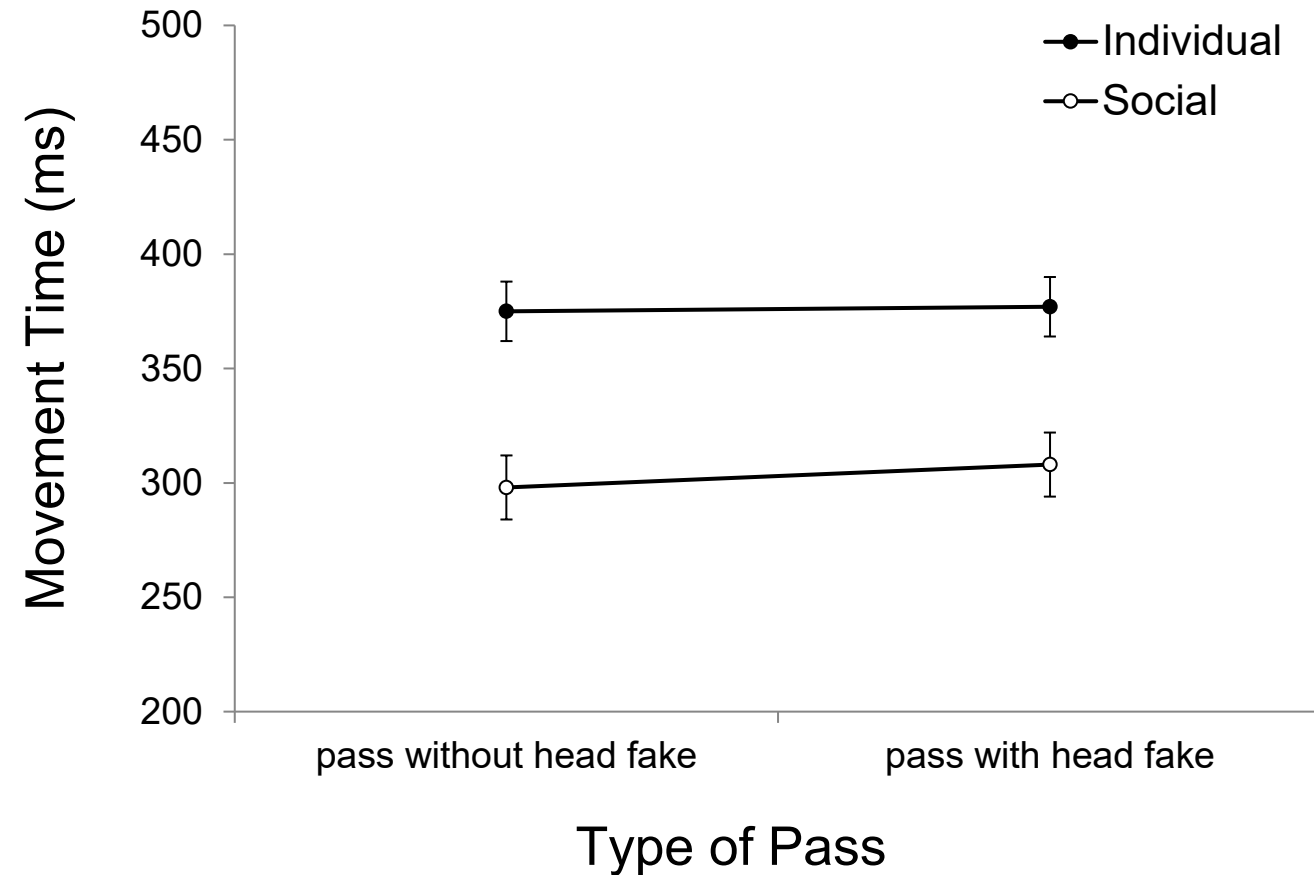$F(1, 23) = 52.659$; $p < .001$; $\eta_p^2 = .696$

- ERs were significantly higher (12.9%) when participants had to perform passes with head fakes compared to passes without head fakes (4.3%), independent of the setting.

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ANOVA (type of pass x setting)

Main effect for setting:
$F(1, 23) = 52.659$; $p < .001$; $\eta_p^2 = .696$

- MTs were significantly faster in the social setting (303 ms) compared to the individual setting (376 ms), independent of the type of pass participants had to perform.

- We found higher fake-production costs in the social setting (159 ms) compared to the individual setting (111 ms), indicating additional social costs occur when deceiving another person (Foerster et al., 2017, 2019; Kunde et al., 2019; Wirth et al., 2018).

- Participants showed superior performance for passes without head fakes in the social scenario (46ms faster) while there was no difference in ITs for passes with head fakes between both settings.

→ Potentially higher motivation/social facilitation benefits generally improved performance in the social interaction setting.

→ While additional social costs hindered performance for passes with head fakes when deceiving another person.

- We found additional social costs (+48 ms) when using deceptive movements in a setting with a social partner, supporting previous research (Kunde et al., 2019).

- However, our data does not allow us to conclusively determine whether social rule violations or monitoring the consequences of deception are the cause of social costs.

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→ Future studies should explore fake-production costs in experienced basketball players in more ecologically valid studies with a social partner

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DFG Deutsche Forschungsgemeinschaft

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OSF

All data and additional information on the study can be found here:

https://osf.io/n9ds4/

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