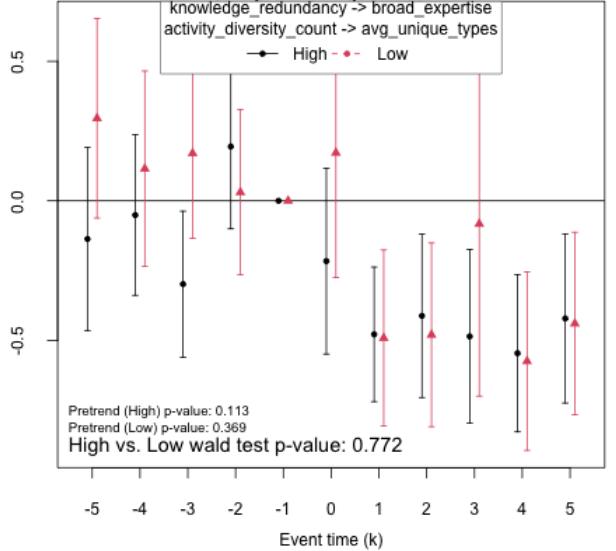


major_minor_release_count rolling5

Sample: num-qualified=1

knowledge_redundancy -> broad_expertise
activity_diversity_count -> avg_unique_types

● High ▲ Low

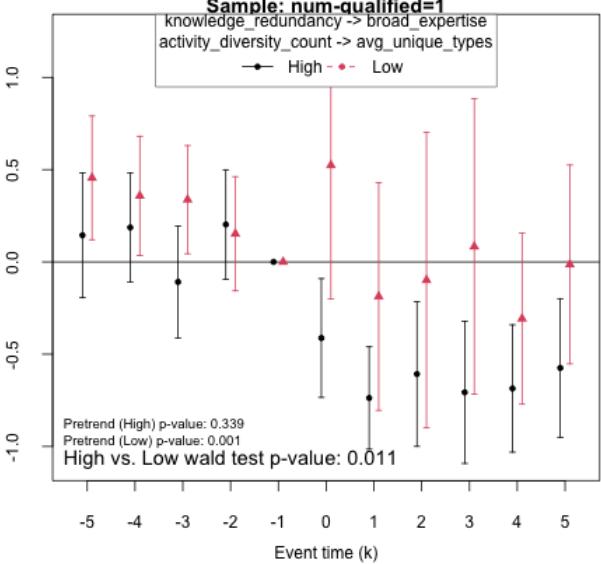


overall_new_release_count rolling5

Sample: num-qualified=1

knowledge_redundancy -> broad_expertise
activity_diversity_count -> avg_unique_types

● High ▲ Low

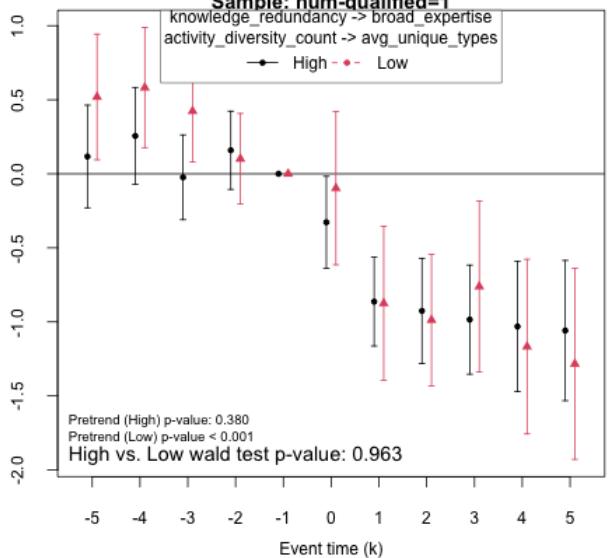


pull_request_merged rolling5

Sample: num-qualified=1

knowledge_redundancy -> broad_expertise
activity_diversity_count -> avg_unique_types

● High ▲ Low

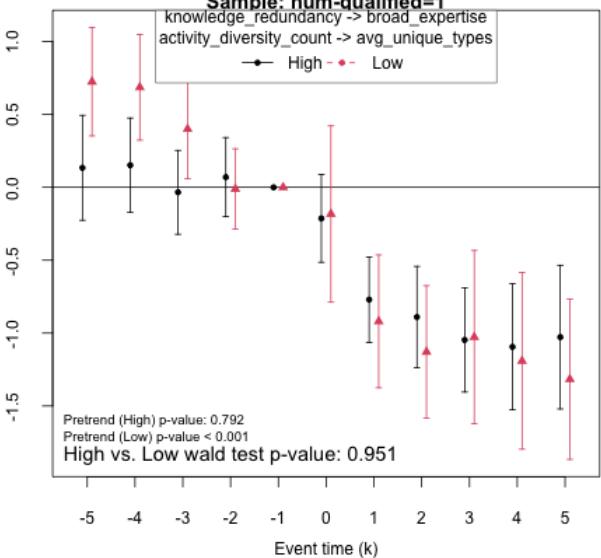


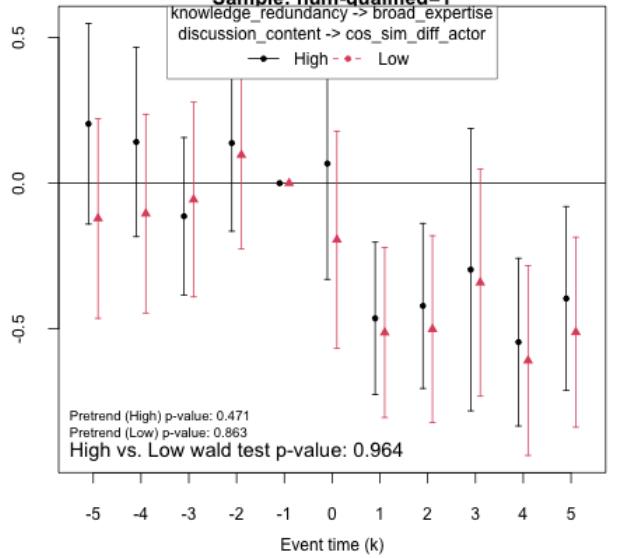
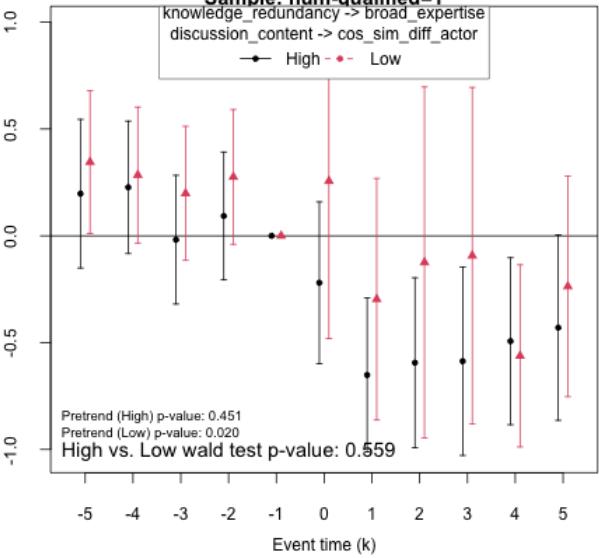
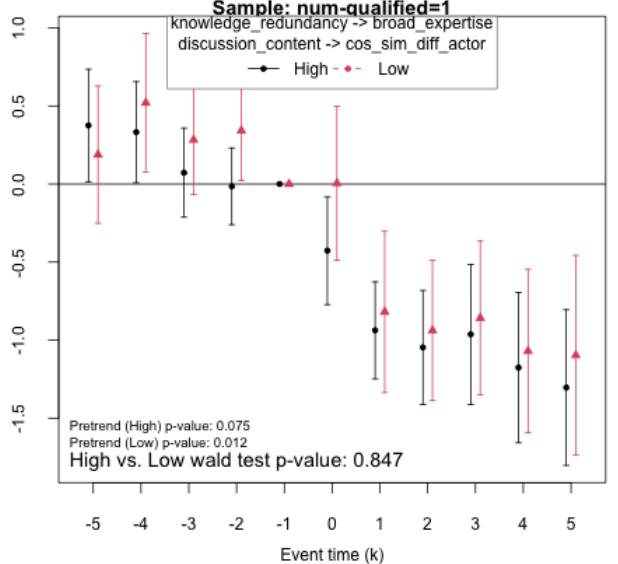
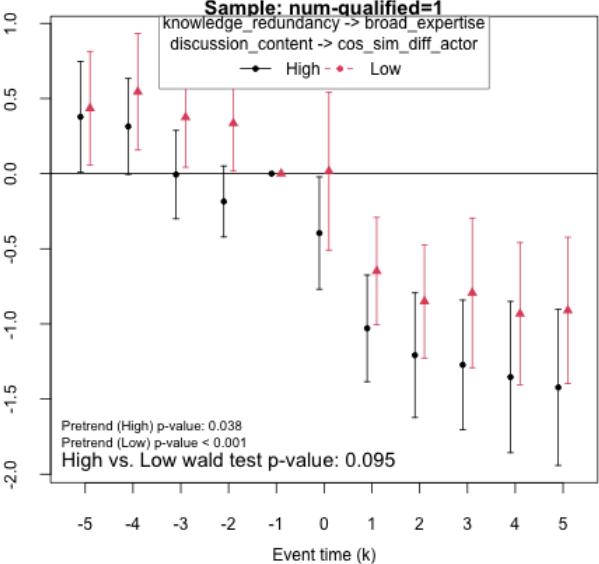
pull_request_opened rolling5

Sample: num-qualified=1

knowledge_redundancy -> broad_expertise
activity_diversity_count -> avg_unique_types

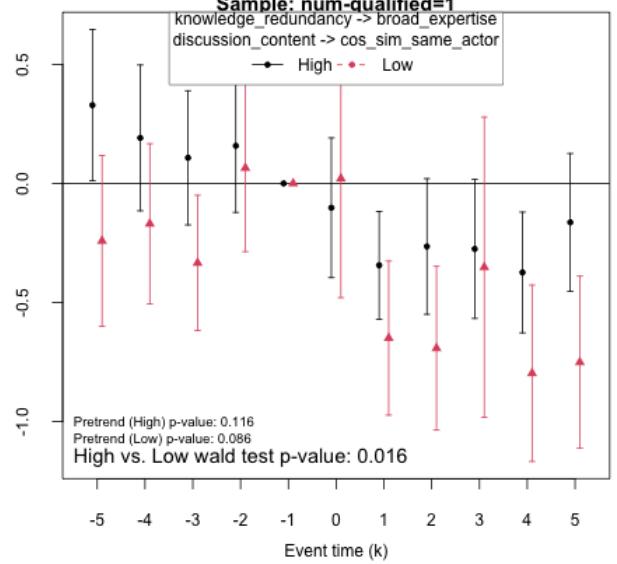
● High ▲ Low



major_minor_release_count rolling5**Sample: num-qualified=1****overall_new_release_count rolling5****Sample: num-qualified=1****pull_request_merged rolling5****Sample: num-qualified=1****pull_request_opened rolling5****Sample: num-qualified=1**

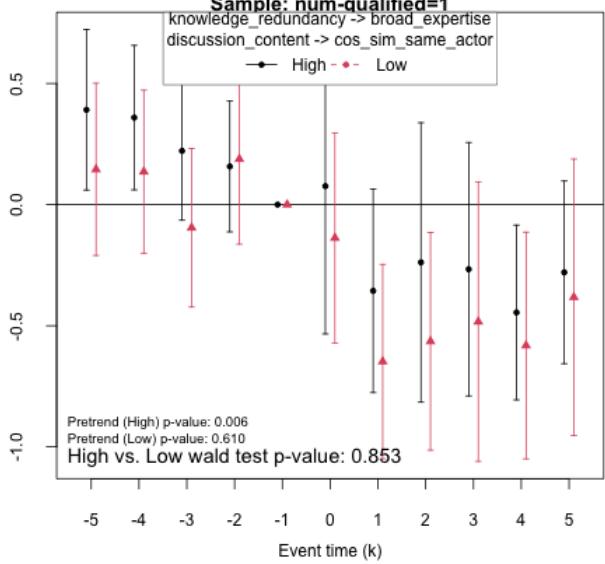
major_minor_release_count rolling5

Sample: num-qualified=1



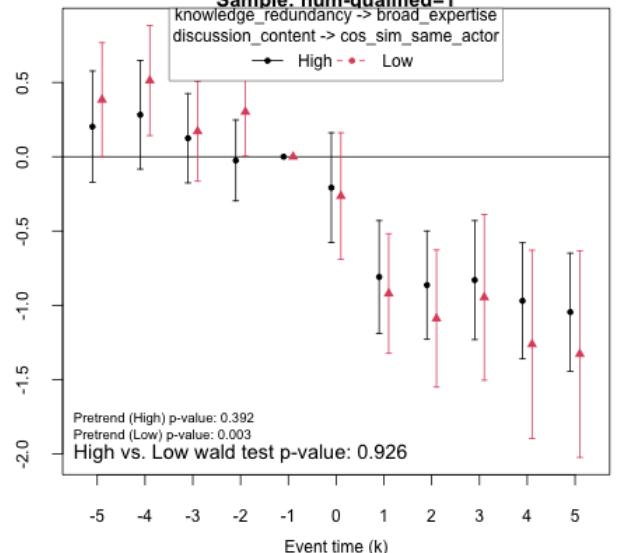
overall_new_release_count rolling5

Sample: num-qualified=1



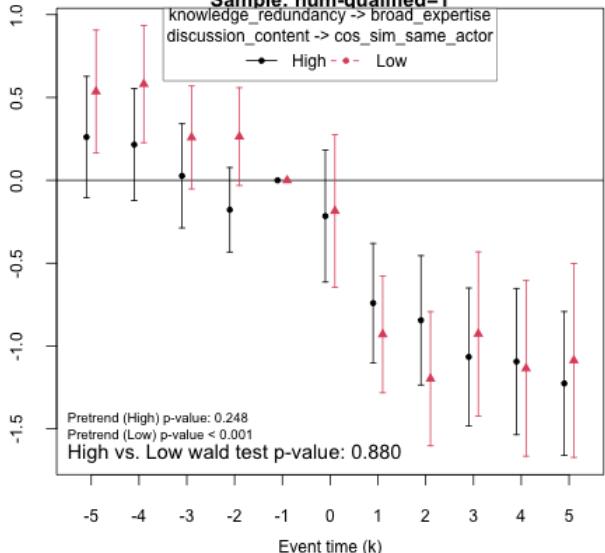
pull_request_merged rolling5

Sample: num-qualified=1



pull_request_opened rolling5

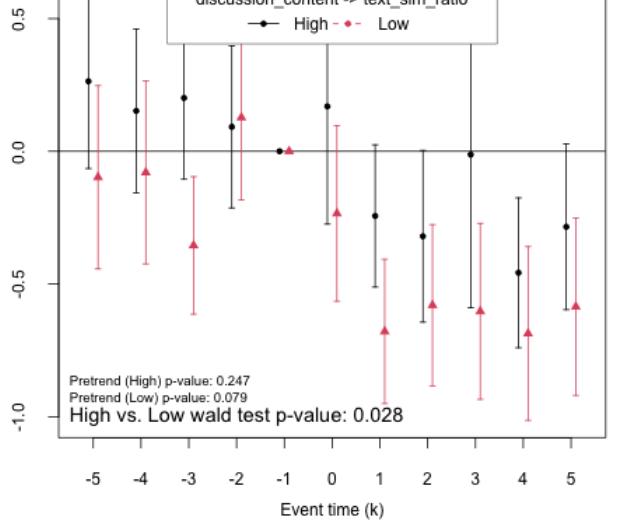
Sample: num-qualified=1



major_minor_release_count rolling5**Sample: num-qualified=1**

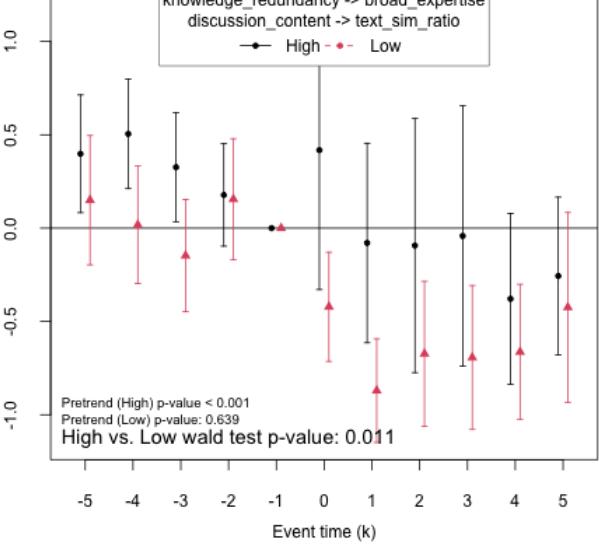
knowledge_redundancy -> broad_expertise
 discussion_content -> text_sim_ratio

● High ▲ Low

**overall_new_release_count rolling5****Sample: num-qualified=1**

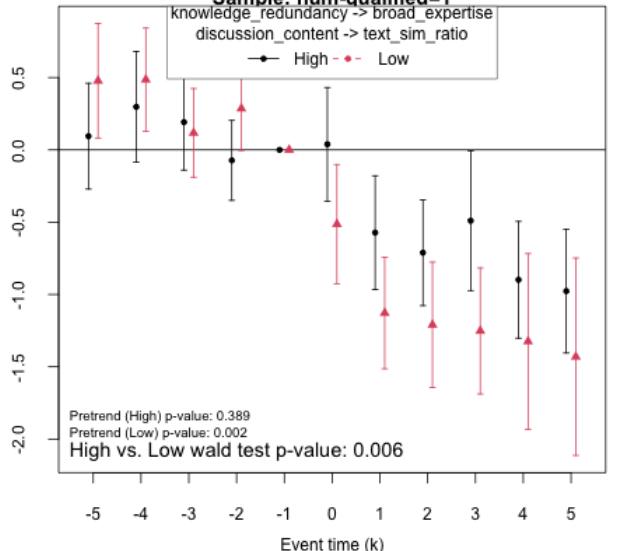
knowledge_redundancy -> broad_expertise
 discussion_content -> text_sim_ratio

● High ▲ Low

**pull_request_merged rolling5****Sample: num-qualified=1**

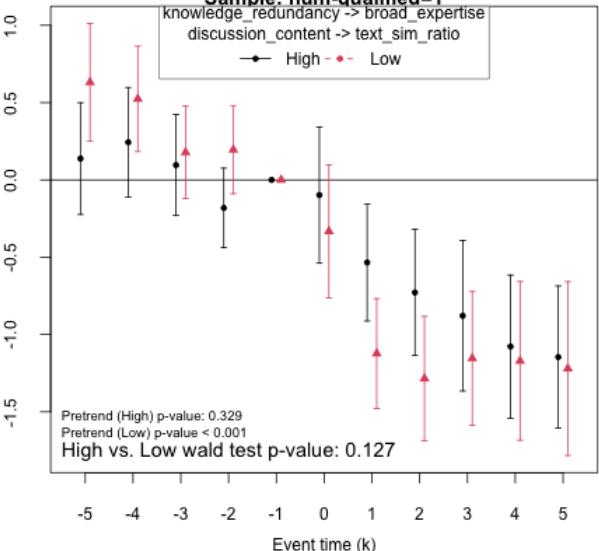
knowledge_redundancy -> broad_expertise
 discussion_content -> text_sim_ratio

● High ▲ Low

**pull_request_opened rolling5****Sample: num-qualified=1**

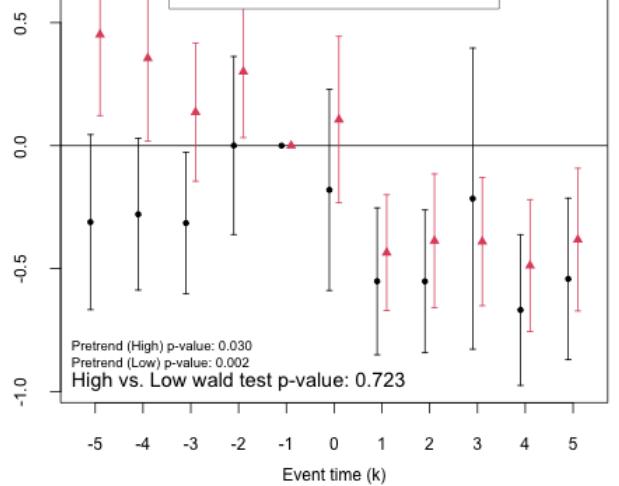
knowledge_redundancy -> broad_expertise
 discussion_content -> text_sim_ratio

● High ▲ Low

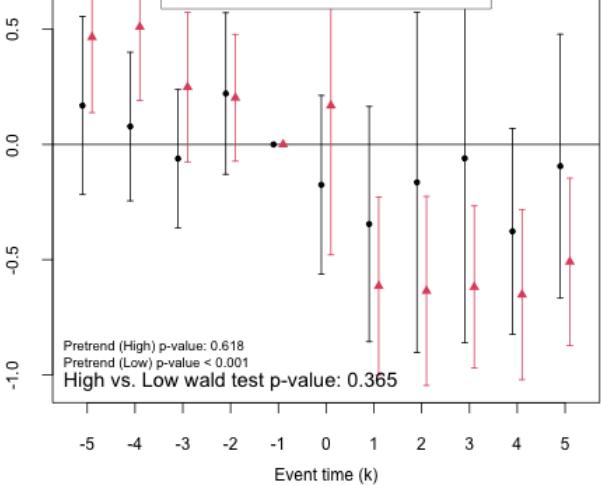


major_minor_release_count rolling5**Sample: num-qualified=1**

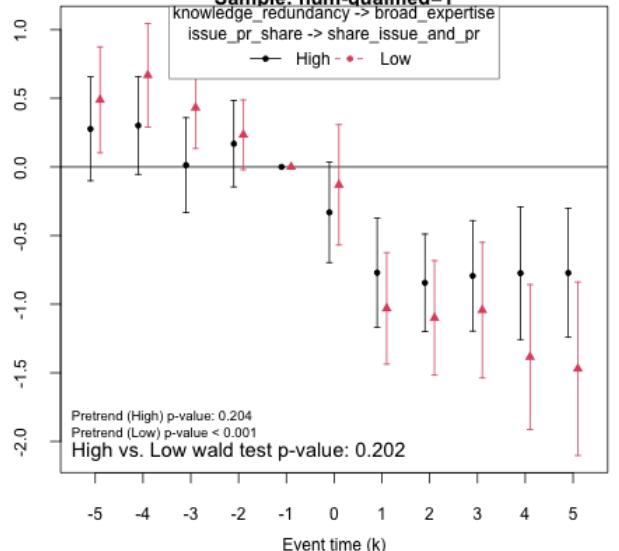
knowledge_redundancy -> broad_expertise
 issue_pr_share -> share_issue_and_pr
 ● High ▲ Low

**overall_new_release_count rolling5****Sample: num-qualified=1**

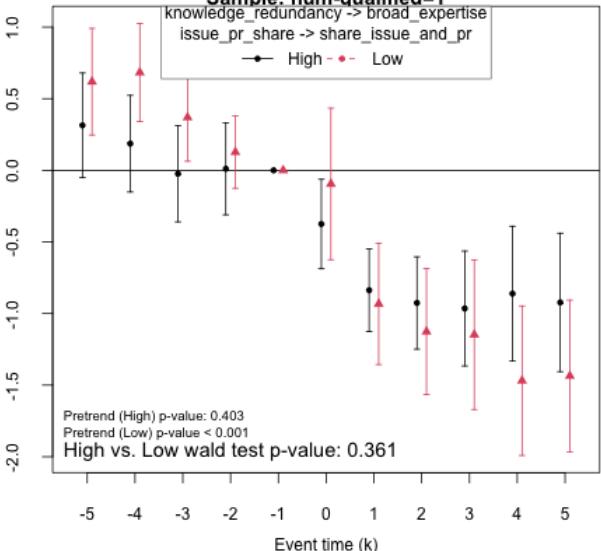
knowledge_redundancy -> broad_expertise
 issue_pr_share -> share_issue_and_pr
 ● High ▲ Low

**pull_request_merged rolling5****Sample: num-qualified=1**

knowledge_redundancy -> broad_expertise
 issue_pr_share -> share_issue_and_pr
 ● High ▲ Low

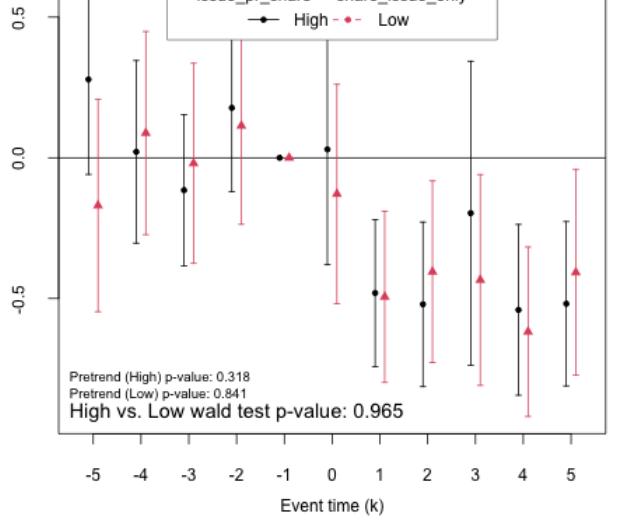
**pull_request_opened rolling5****Sample: num-qualified=1**

knowledge_redundancy -> broad_expertise
 issue_pr_share -> share_issue_and_pr
 ● High ▲ Low

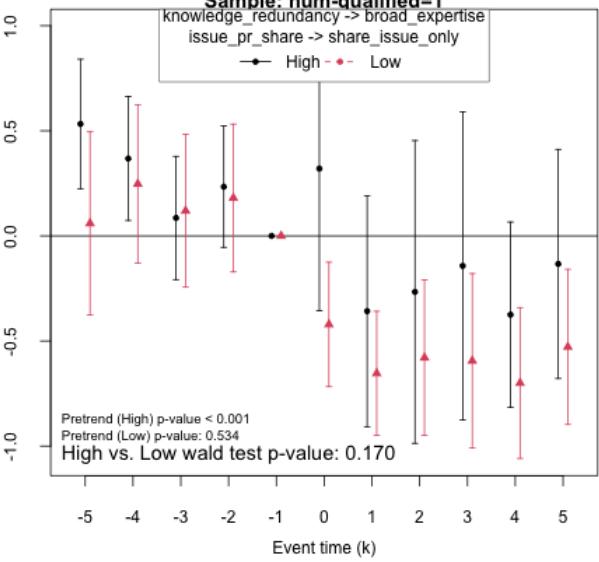


major_minor_release_count rolling5**Sample: num-qualified=1**

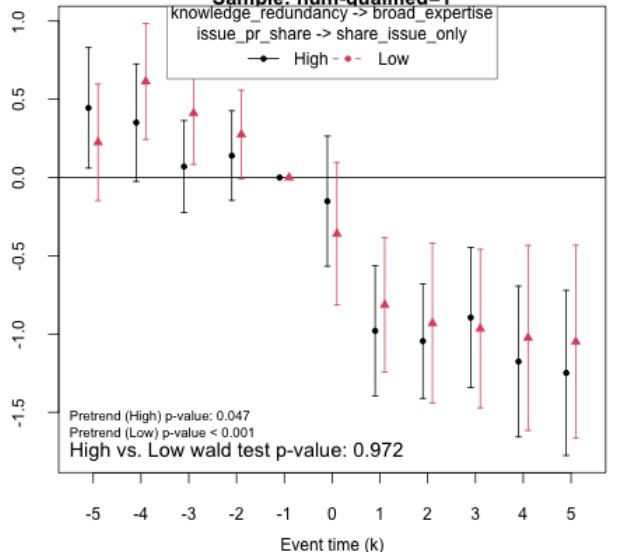
knowledge_redundancy -> broad_expertise
 issue_pr_share -> share_issue_only
 ● High ▲ Low

**overall_new_release_count rolling5****Sample: num-qualified=1**

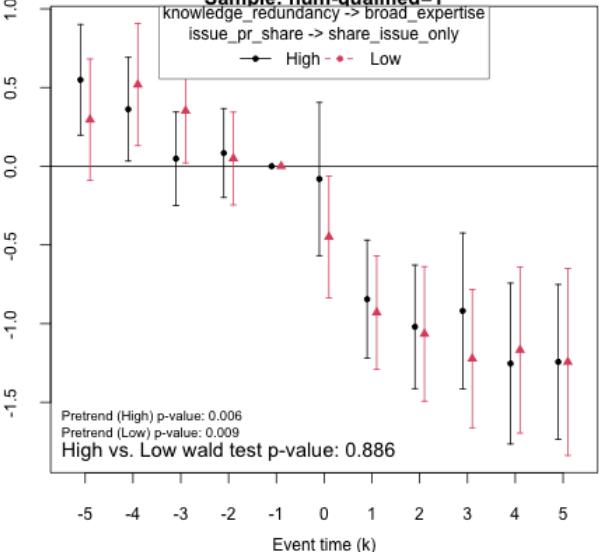
knowledge_redundancy -> broad_expertise
 issue_pr_share -> share_issue_only
 ● High ▲ Low

**pull_request_merged rolling5****Sample: num-qualified=1**

knowledge_redundancy -> broad_expertise
 issue_pr_share -> share_issue_only
 ● High ▲ Low

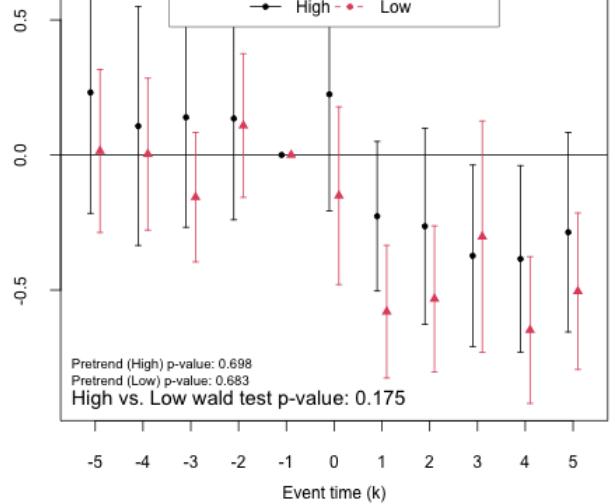
**pull_request_opened rolling5****Sample: num-qualified=1**

knowledge_redundancy -> broad_expertise
 issue_pr_share -> share_issue_only
 ● High ▲ Low



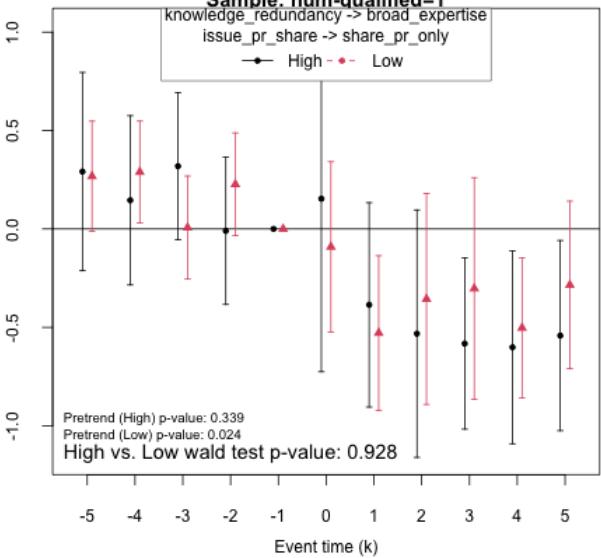
major_minor_release_count rolling5

Sample: num-qualified=1
knowledge_redundancy -> broad_expertise
issue_pr_share -> share_pr_only
● High ▲ Low



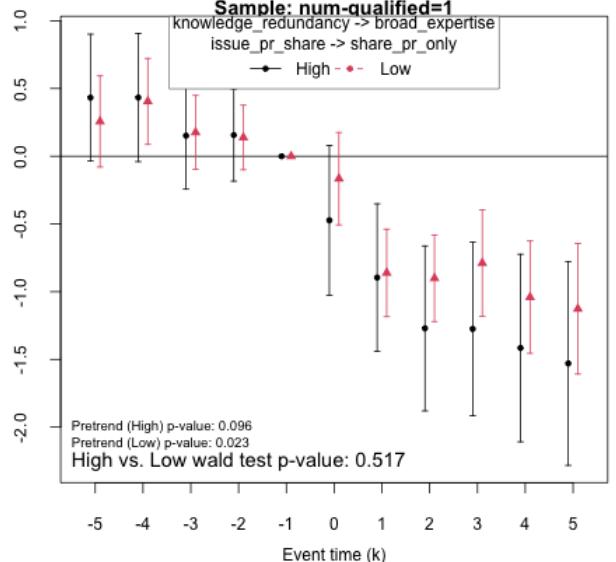
overall_new_release_count rolling5

Sample: num-qualified=1
knowledge_redundancy -> broad_expertise
issue_pr_share -> share_pr_only
● High ▲ Low



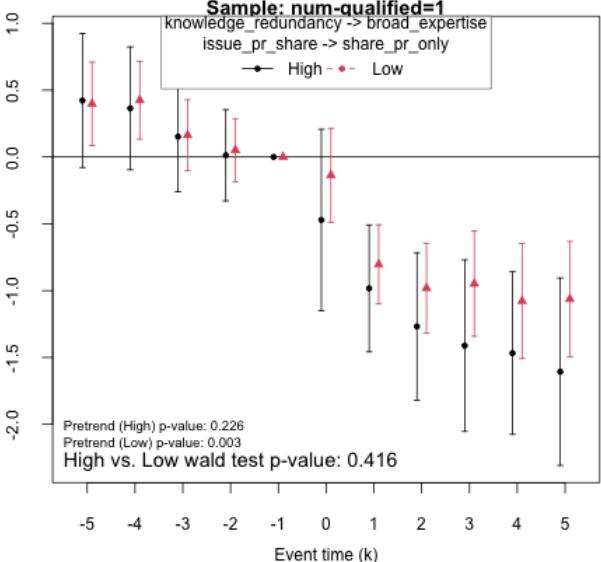
pull_request_merged rolling5

Sample: num-qualified=1
knowledge_redundancy -> broad_expertise
issue_pr_share -> share_pr_only
● High ▲ Low



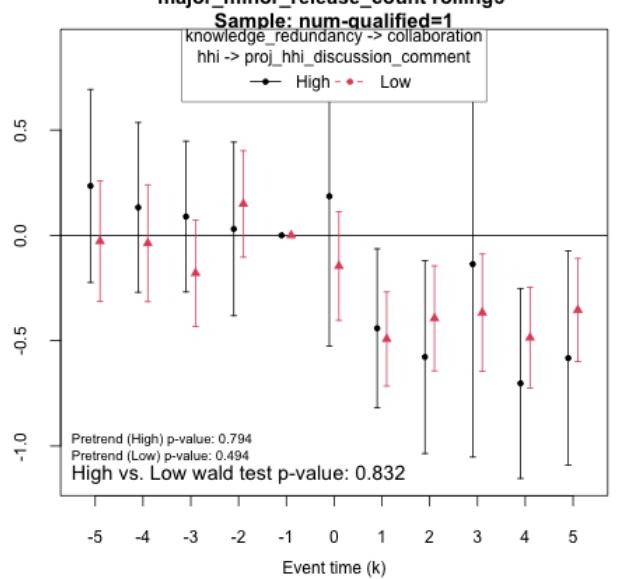
pull_request_opened rolling5

Sample: num-qualified=1
knowledge_redundancy -> broad_expertise
issue_pr_share -> share_pr_only
● High ▲ Low

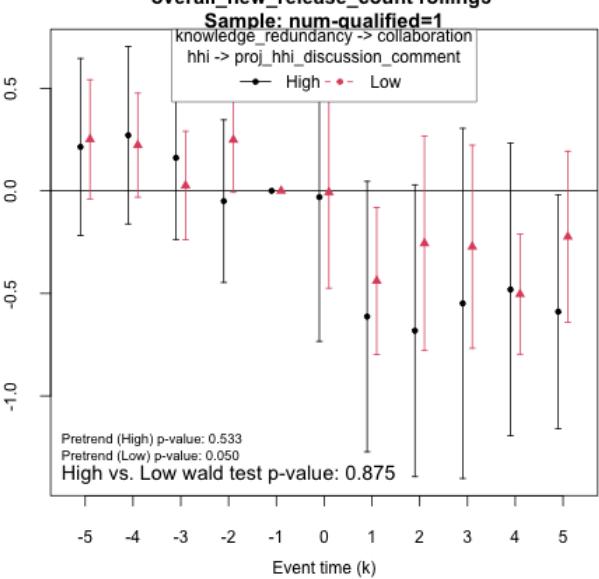


major_minor_release_count rolling5

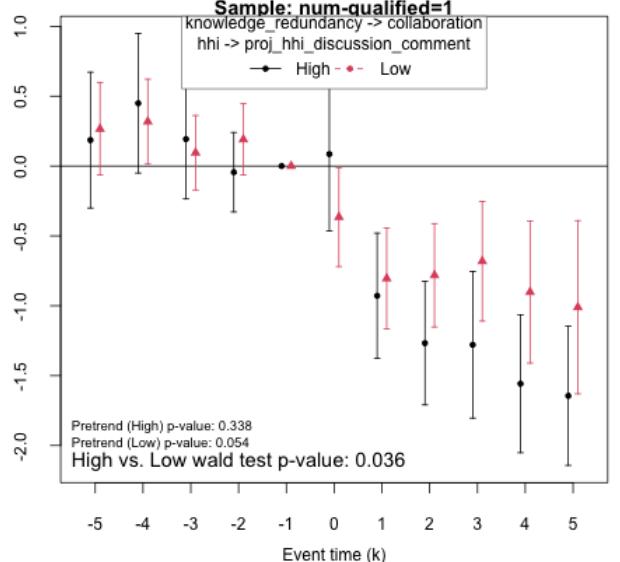
Sample: num-qualified=1
knowledge_redundancy -> collaboration
 $hh_i \rightarrow proj_hh_i$ discussion_comment
● High ▲ Low

**overall_new_release_count rolling5**

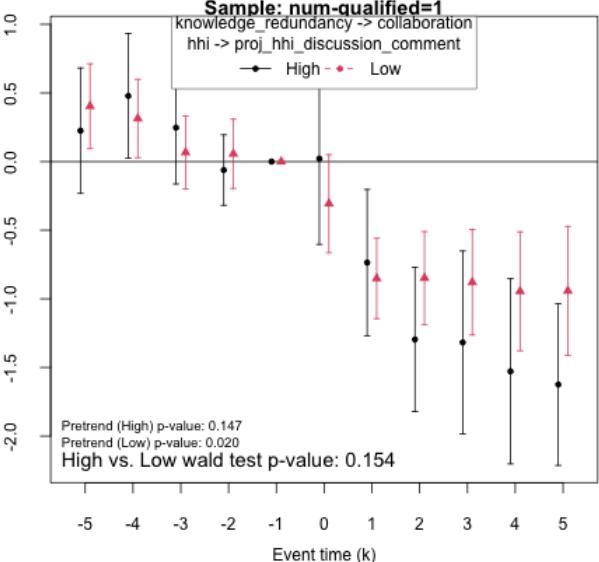
Sample: num-qualified=1
knowledge_redundancy -> collaboration
 $hh_i \rightarrow proj_hh_i$ discussion_comment
● High ▲ Low

**pull_request_merged rolling5**

Sample: num-qualified=1
knowledge_redundancy -> collaboration
 $hh_i \rightarrow proj_hh_i$ discussion_comment
● High ▲ Low

**pull_request_opened rolling5**

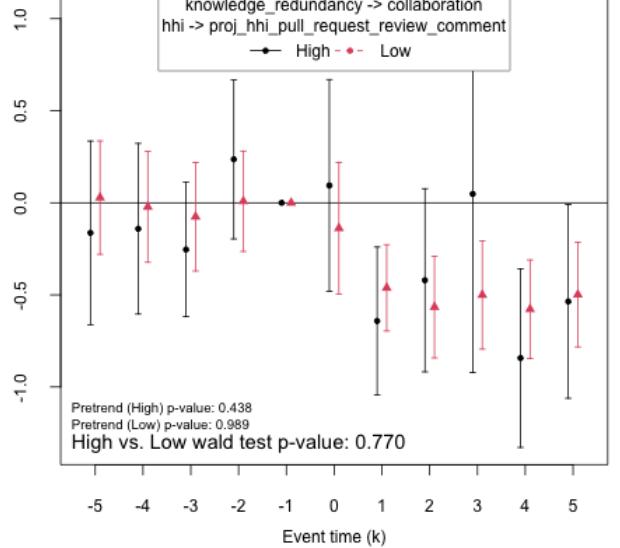
Sample: num-qualified=1
knowledge_redundancy -> collaboration
 $hh_i \rightarrow proj_hh_i$ discussion_comment
● High ▲ Low



major_minor_release_count rolling5

knowledge_redundancy->collaboration
hhicr -> proj_hhicr_pull_request_review_comment

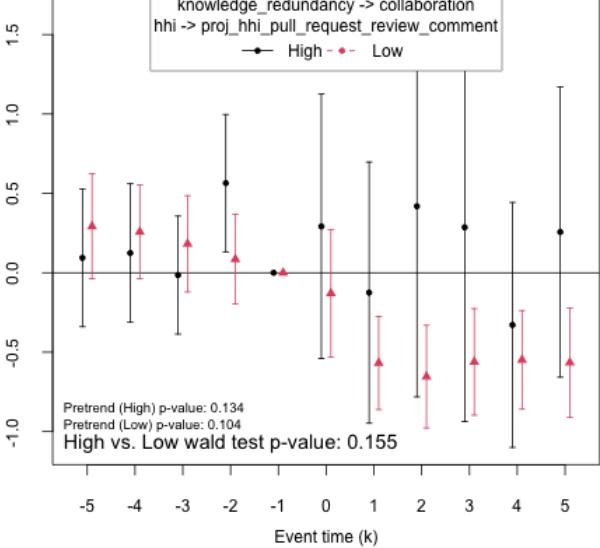
● High ▲ Low



overall_new_release_count rolling5

knowledge_redundancy->collaboration
hhicr -> proj_hhicr_pull_request_review_comment

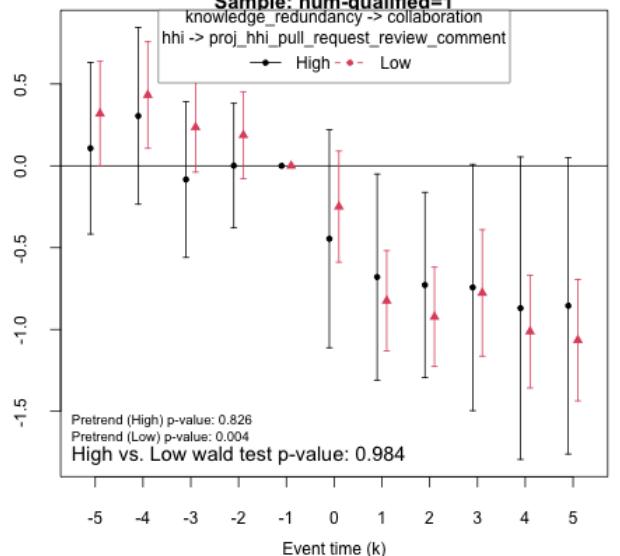
● High ▲ Low



pull_request_merged rolling5

knowledge_redundancy->collaboration
hhicr -> proj_hhicr_pull_request_review_comment

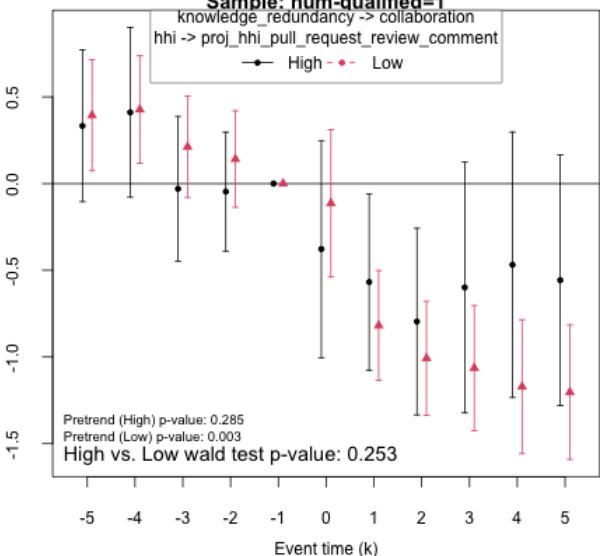
● High ▲ Low



pull_request_opened rolling5

knowledge_redundancy->collaboration
hhicr -> proj_hhicr_pull_request_review_comment

● High ▲ Low

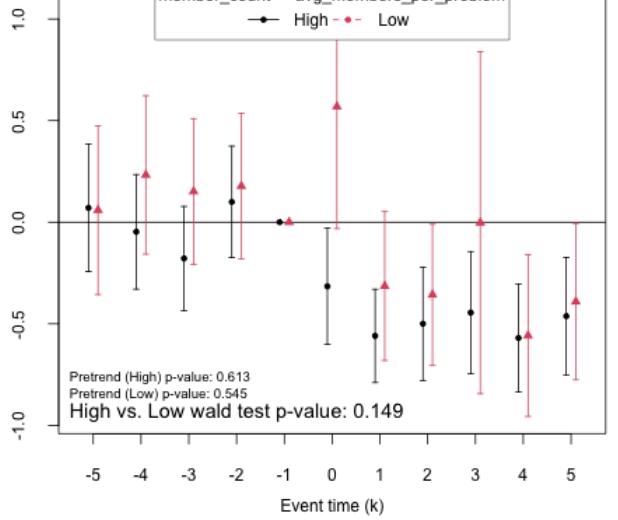


major_minor_release_count rolling5

Sample: num-qualified=1

knowledge_redundancy -> collaboration
member_count -> avg_members_per_problem

● High ▲ Low

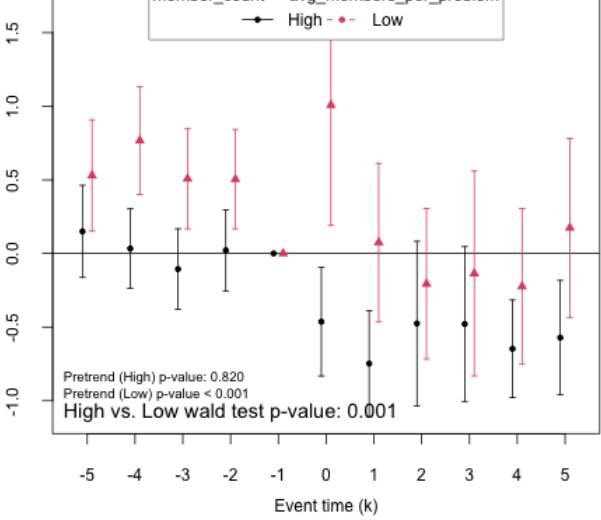


overall_new_release_count rolling5

Sample: num-qualified=1

knowledge_redundancy -> collaboration
member_count -> avg_members_per_problem

● High ▲ Low

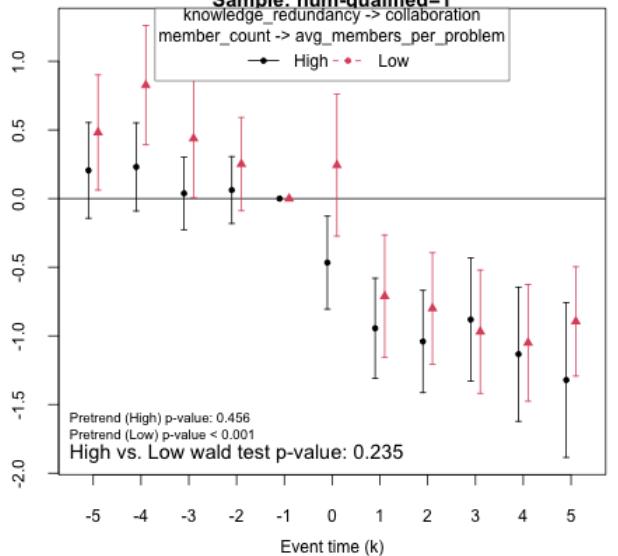


pull_request_merged rolling5

Sample: num-qualified=1

knowledge_redundancy -> collaboration
member_count -> avg_members_per_problem

● High ▲ Low

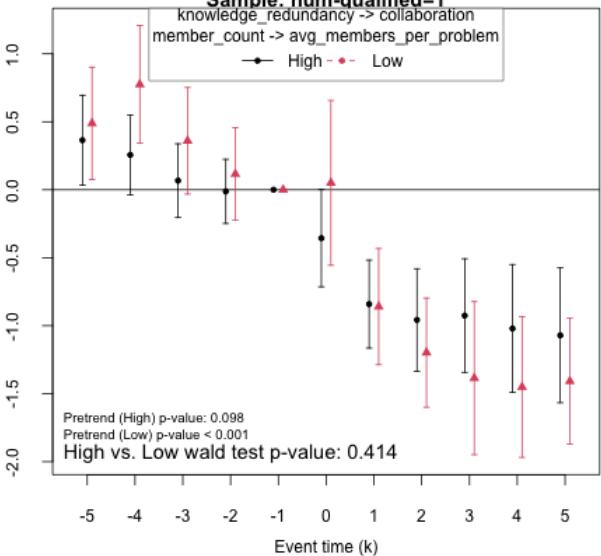


pull_request_opened rolling5

Sample: num-qualified=1

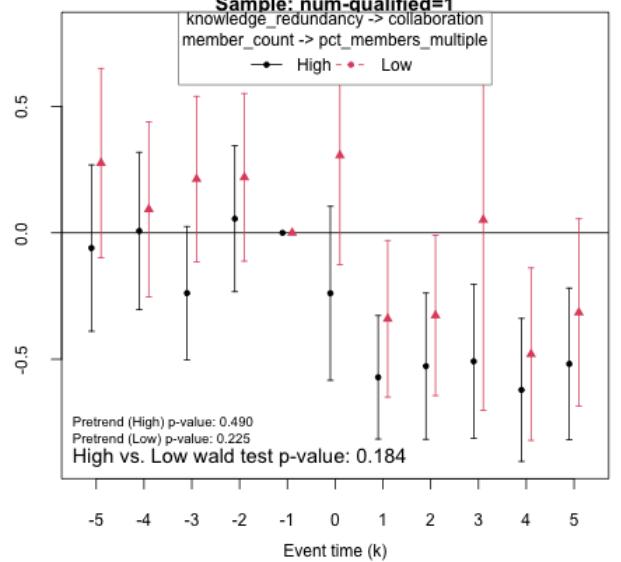
knowledge_redundancy -> collaboration
member_count -> avg_members_per_problem

● High ▲ Low

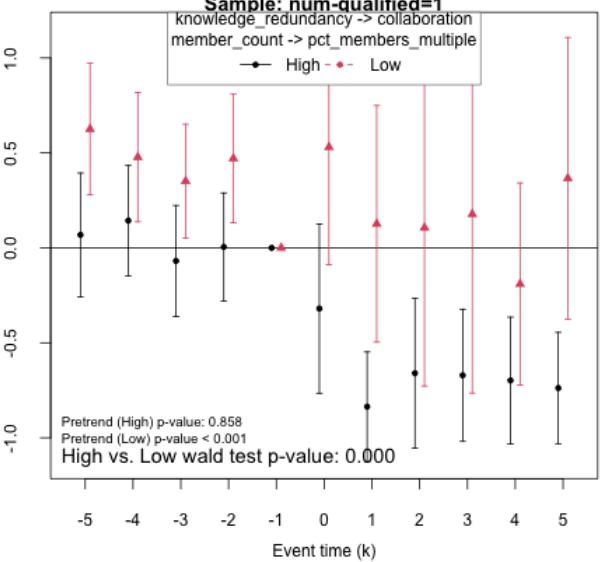


major_minor_release_count rolling5

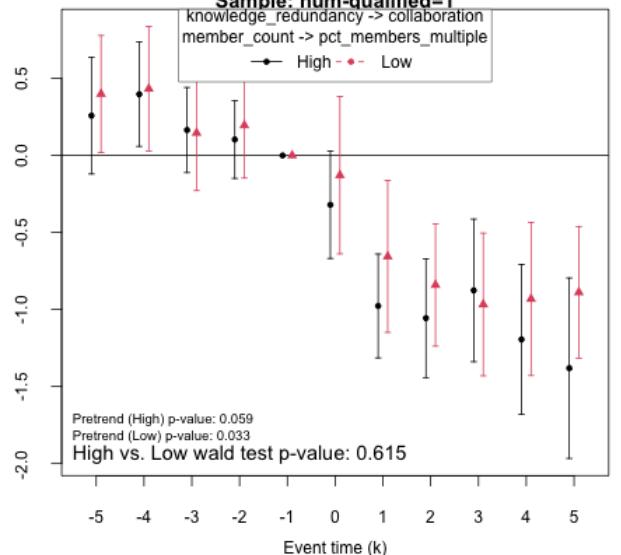
Sample: num-qualified=1

**overall_new_release_count rolling5**

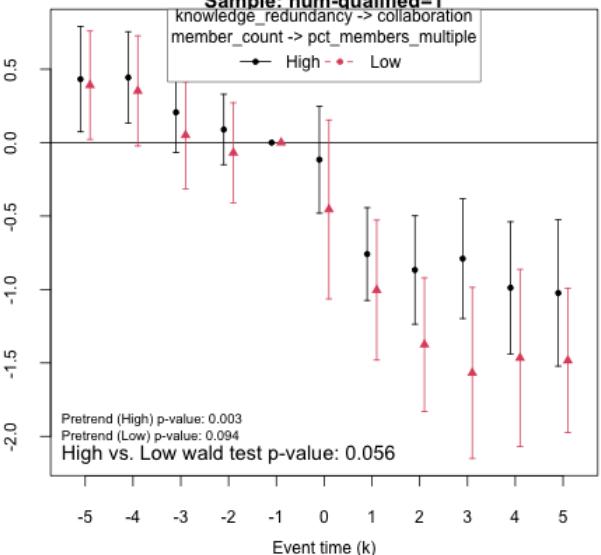
Sample: num-qualified=1

**pull_request_merged rolling5**

Sample: num-qualified=1

**pull_request_opened rolling5**

Sample: num-qualified=1

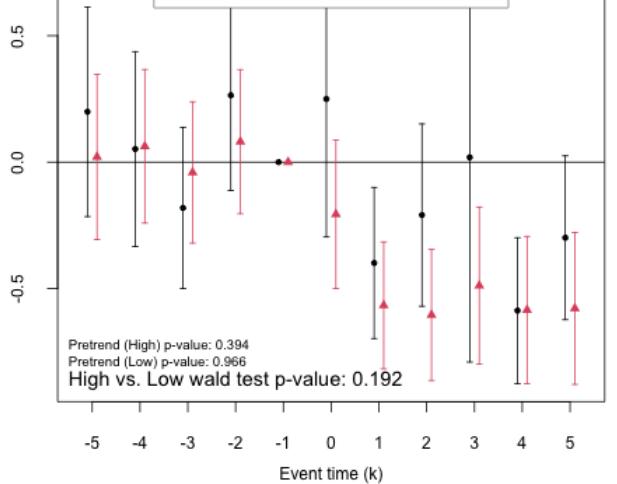


major_minor_release_count rolling5

Sample: num-qualified=1

knowledge_redundancy -> collaboration
 problem_hhi -> proj_prob_hhi_issue_comment

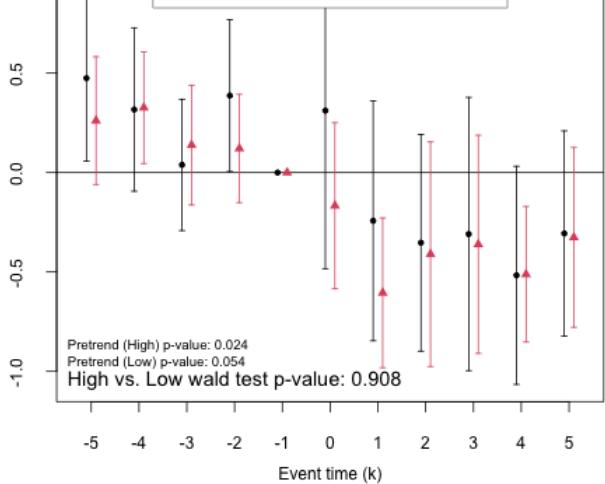
- High
- Low

**overall_new_release_count rolling5**

Sample: num-qualified=1

knowledge_redundancy -> collaboration
 problem_hhi -> proj_prob_hhi_issue_comment

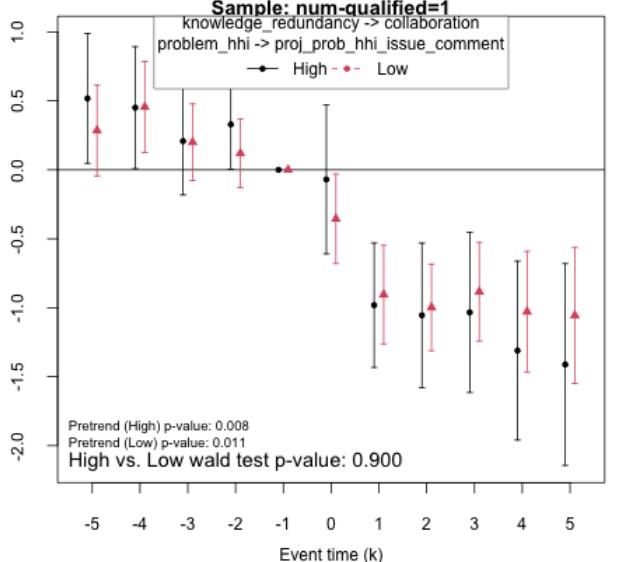
- High
- Low

**pull_request_merged rolling5**

Sample: num-qualified=1

knowledge_redundancy -> collaboration
 problem_hhi -> proj_prob_hhi_issue_comment

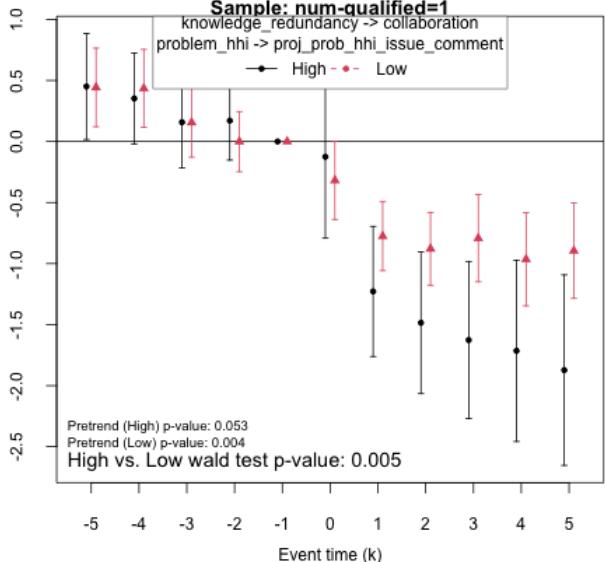
- High
- Low

**pull_request_opened rolling5**

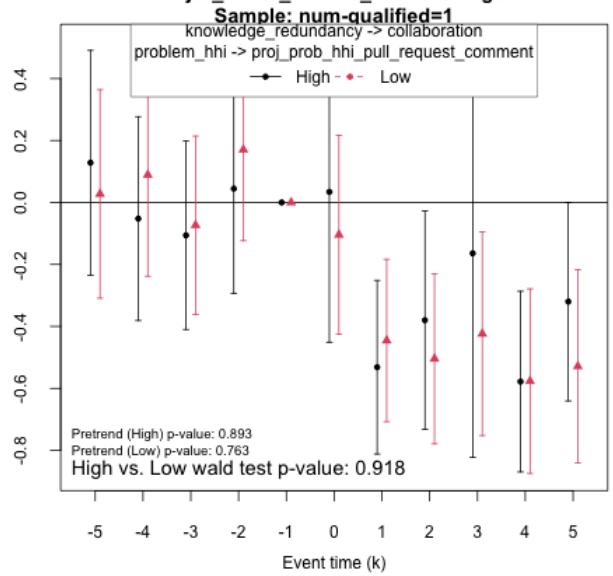
Sample: num-qualified=1

knowledge_redundancy -> collaboration
 problem_hhi -> proj_prob_hhi_issue_comment

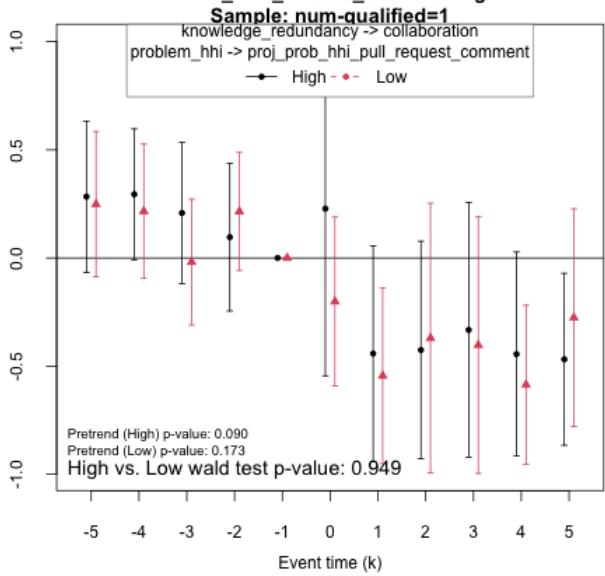
- High
- Low



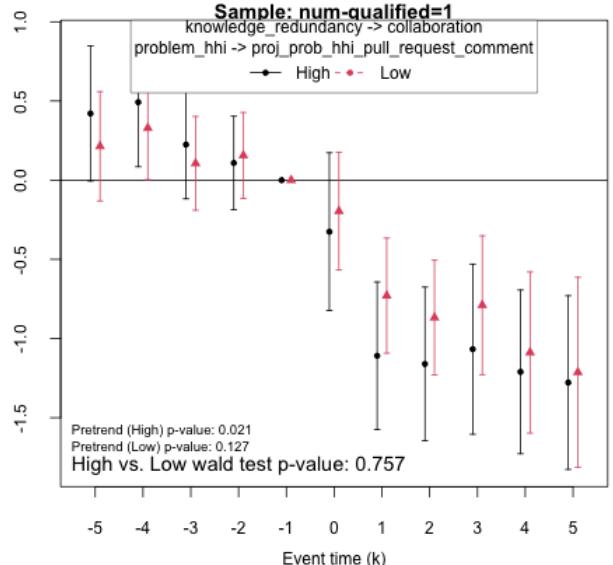
major_minor_release_count rolling5



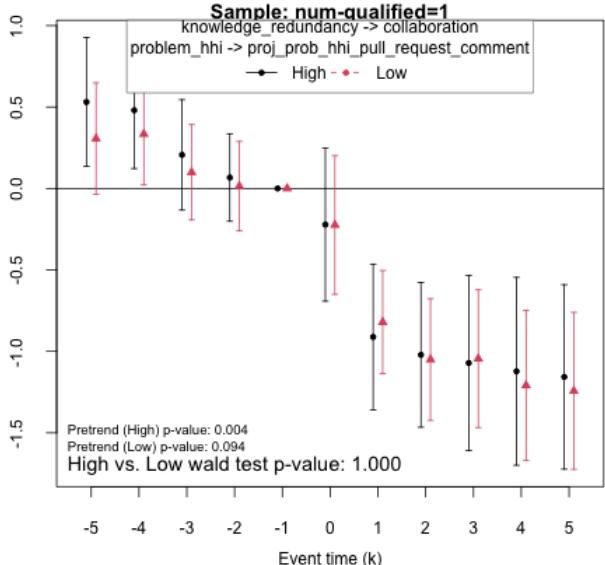
overall_new_release_count rolling5



pull_request_merged rolling5



pull_request_opened rolling5

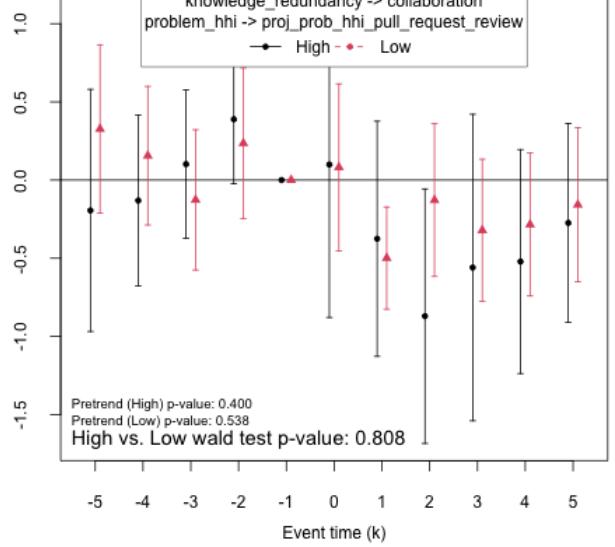


major_minor_release_count rolling5

knowledge_redundancy->collaboration

problem_hhi->proj_prob_hhi_pull_request_review

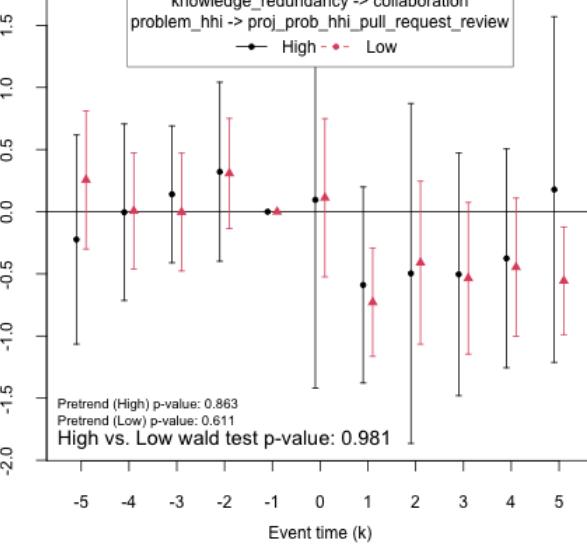
● High ▲ Low

**overall_new_release_count rolling5**

knowledge_redundancy->collaboration

problem_hhi->proj_prob_hhi_pull_request_review

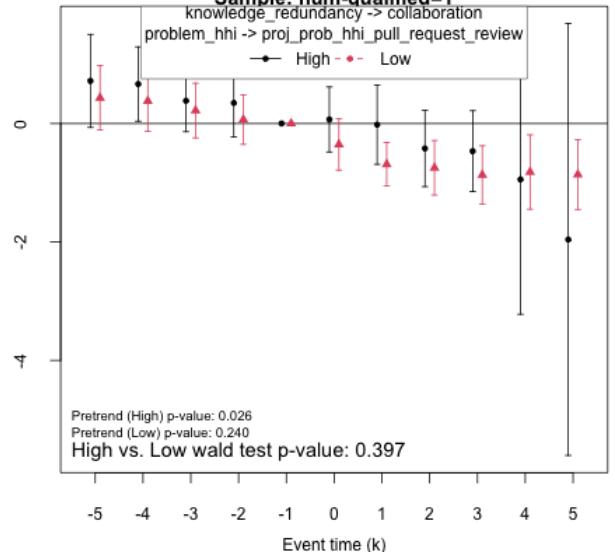
● High ▲ Low

**pull_request_merged rolling5**

knowledge_redundancy->collaboration

problem_hhi->proj_prob_hhi_pull_request_review

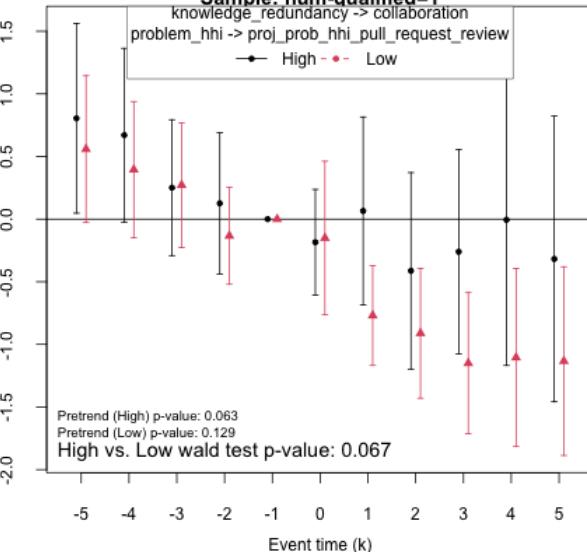
● High ▲ Low

**pull_request_opened rolling5**

knowledge_redundancy->collaboration

problem_hhi->proj_prob_hhi_pull_request_review

● High ▲ Low

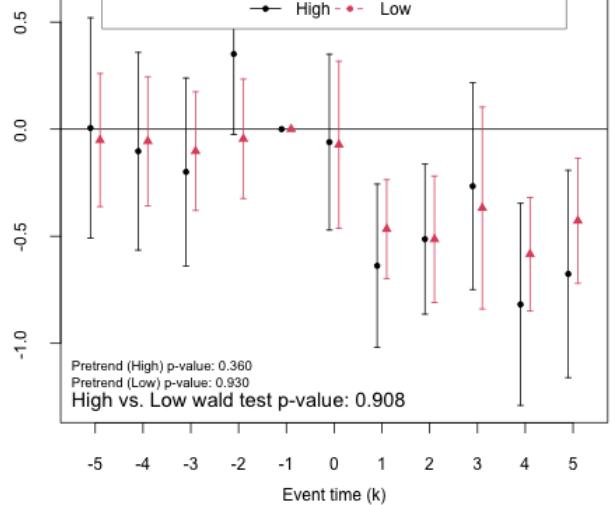


major_minor_release_count rolling5

Sample: num-qualified=1

knowledge_redundancy -> collaboration

problem_hhi -> proj_prob_hhi_pull_request_review_comment
● High -● Low

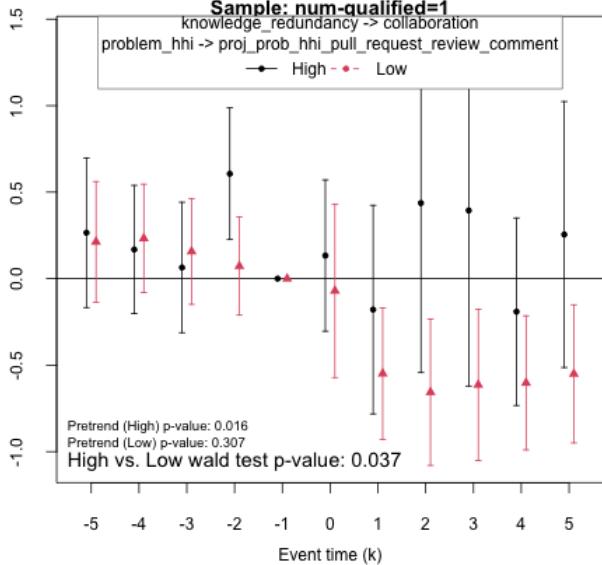


overall_new_release_count rolling5

Sample: num-qualified=1

knowledge_redundancy -> collaboration

problem_hhi -> proj_prob_hhi_pull_request_review_comment
● High -● Low

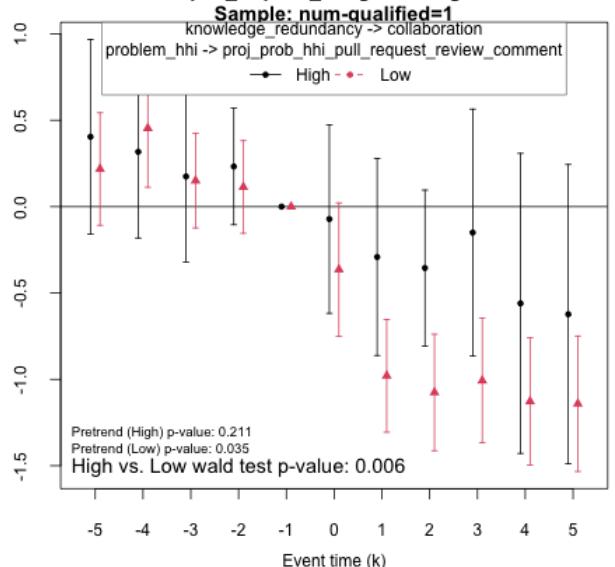


pull_request_merged rolling5

Sample: num-qualified=1

knowledge_redundancy -> collaboration

problem_hhi -> proj_prob_hhi_pull_request_review_comment
● High -● Low

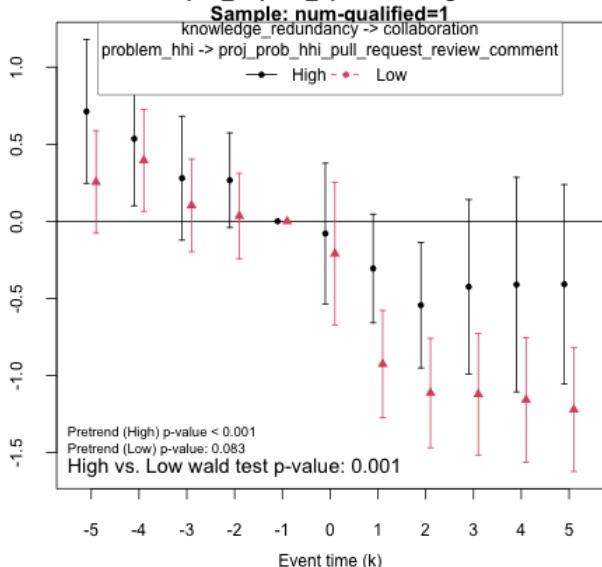


pull_request_opened rolling5

Sample: num-qualified=1

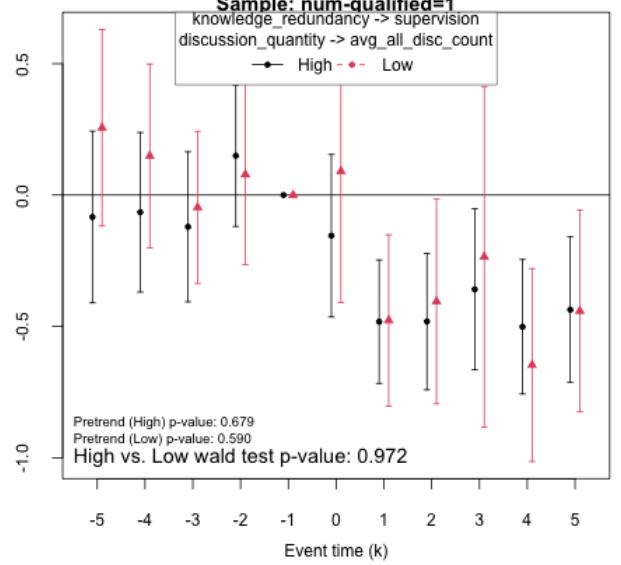
knowledge_redundancy -> collaboration

problem_hhi -> proj_prob_hhi_pull_request_review_comment
● High -● Low



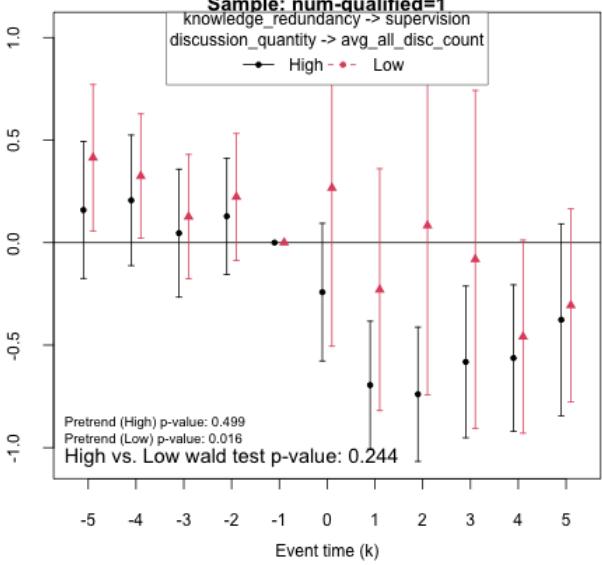
major_minor_release_count rolling5

Sample: num-qualified=1



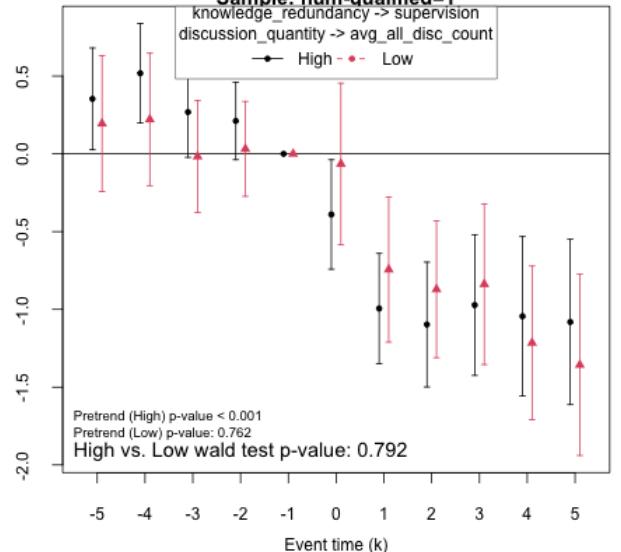
overall_new_release_count rolling5

Sample: num-qualified=1



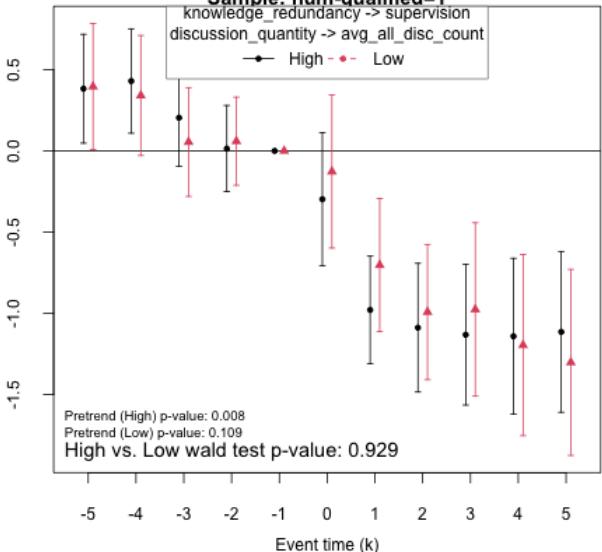
pull_request_merged rolling5

Sample: num-qualified=1

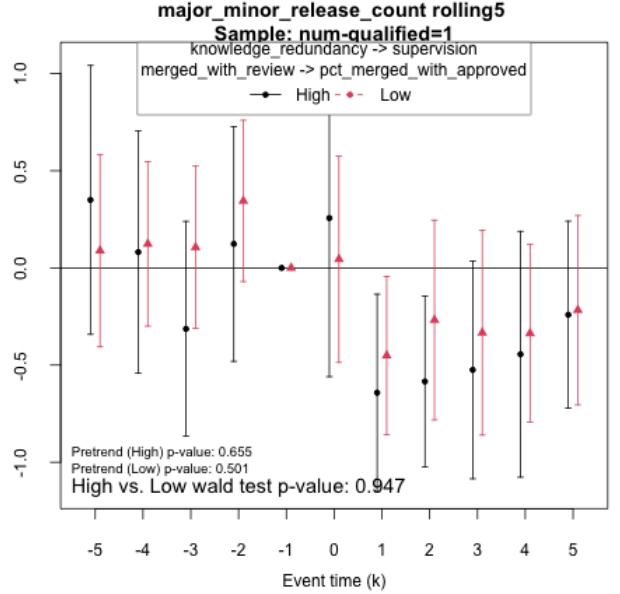


pull_request_opened rolling5

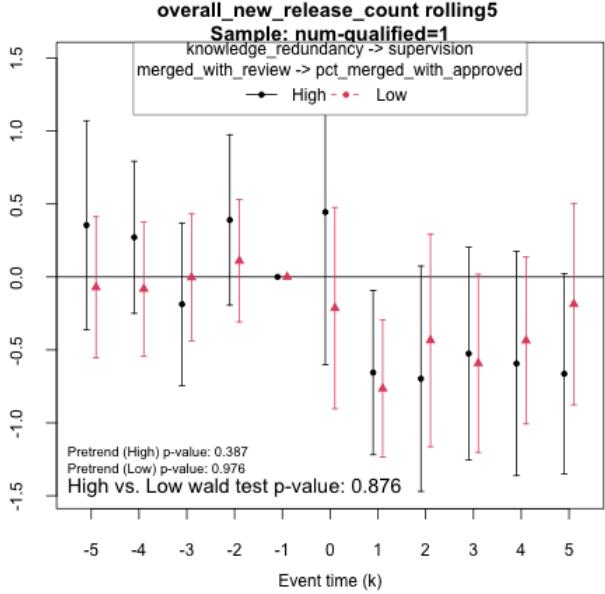
Sample: num-qualified=1



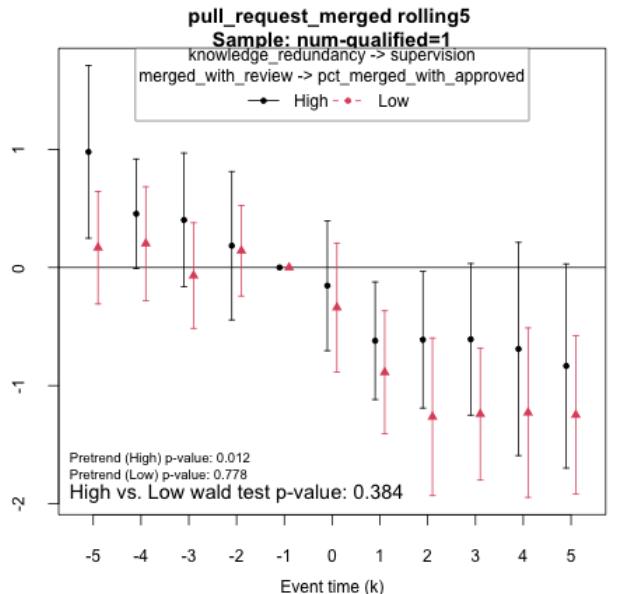
major_minor_release_count rolling5



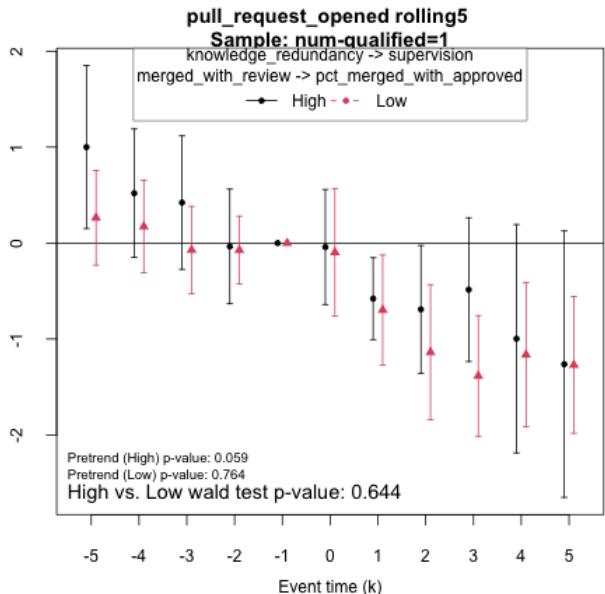
overall_new_release_count rolling5



pull_request_merged rolling5



pull_request_opened rolling5



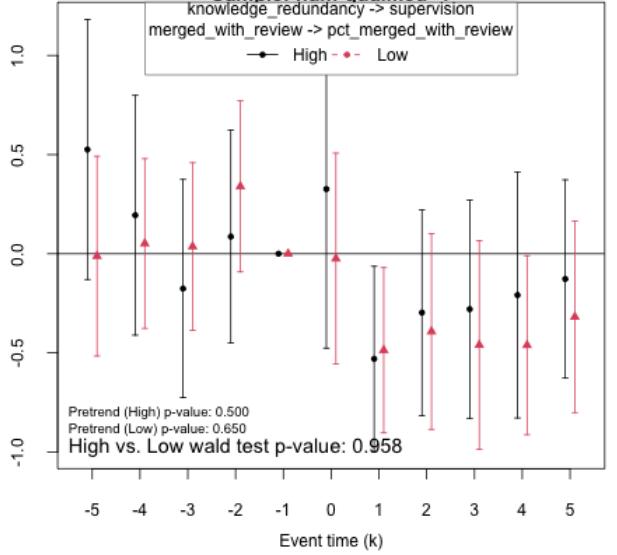
major_minor_release_count rolling5

Sample: num-qualified=1

knowledge_redundancy-> supervision

merged_with_review -> pct_merged_with_review

● High ▲ Low



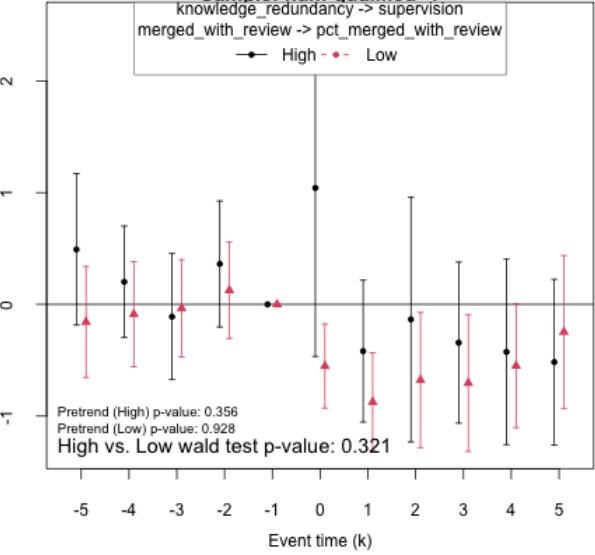
overall_new_release_count rolling5

Sample: num-qualified=1

knowledge_redundancy-> supervision

merged_with_review -> pct_merged_with_review

● High ▲ Low

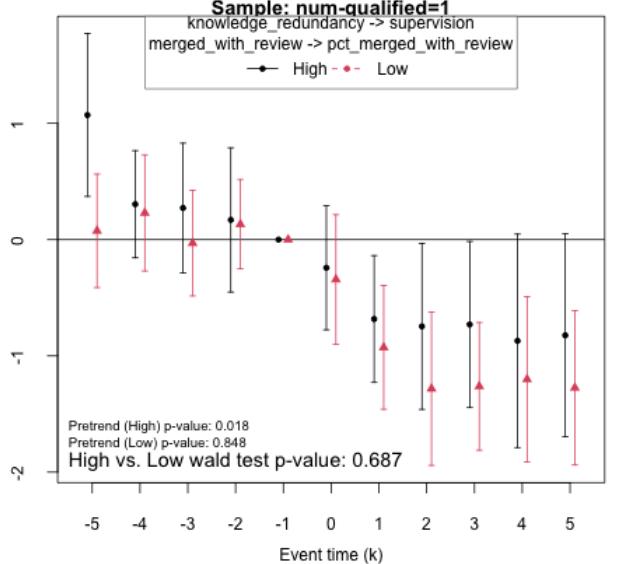


pull_request_merged rolling5

Sample: num-qualified=1

knowledge_redundancy-> supervision

● High ▲ Low

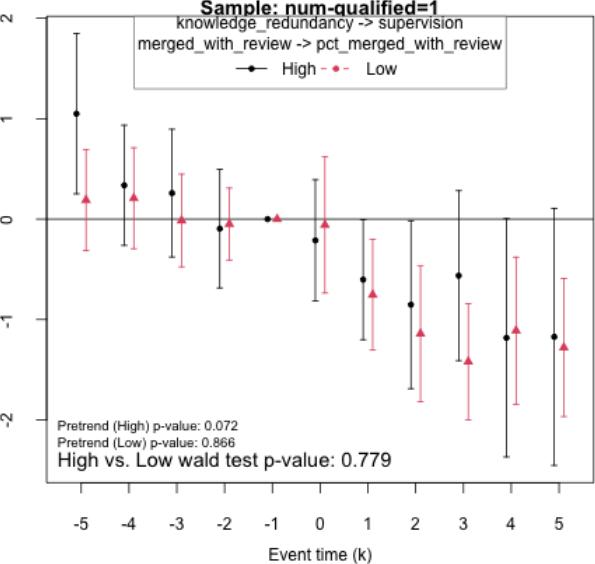


pull_request_opened rolling5

Sample: num-qualified=1

knowledge_redundancy-> supervision

merged_with_review -> pct_merged_with_review

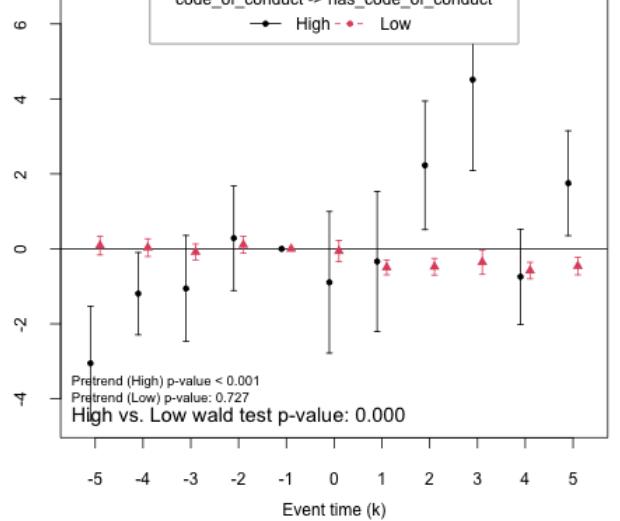


major_minor_release_count rolling5

Sample: num-qualified=1

organizational_routines -> newcomer_guidelines
code_of_conduct -> has_code_of_conduct

● High - ● Low

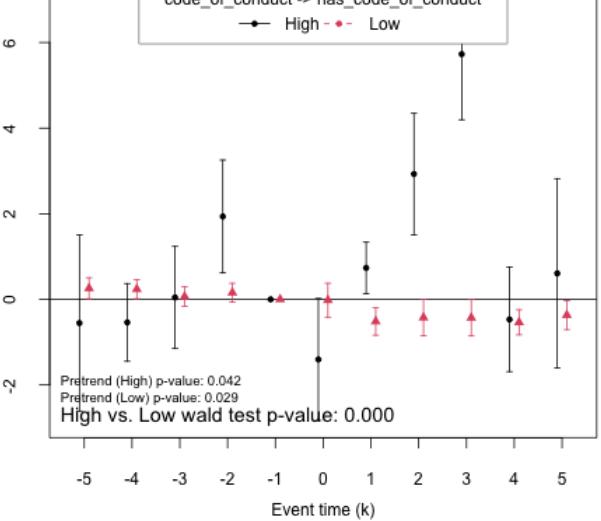


overall_new_release_count rolling5

Sample: num-qualified=1

organizational_routines -> newcomer_guidelines
code_of_conduct -> has_code_of_conduct

● High - ● Low

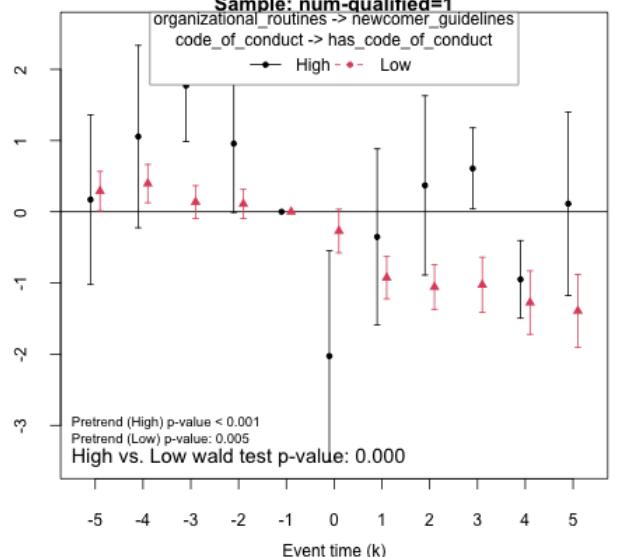


pull_request_merged rolling5

Sample: num-qualified=1

organizational_routines -> newcomer_guidelines
code_of_conduct -> has_code_of_conduct

● High - ● Low

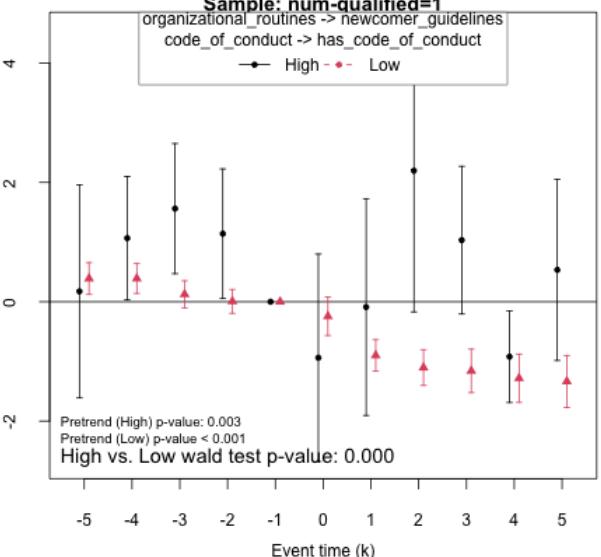


pull_request_opened rolling5

Sample: num-qualified=1

organizational_routines -> newcomer_guidelines
code_of_conduct -> has_code_of_conduct

● High - ● Low

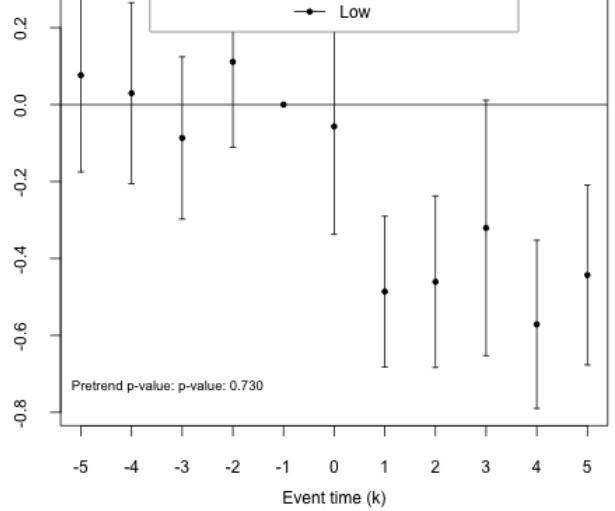


major_minor_release_count rolling5

Sample: num-qualified=1

organizational_routines -> newcomer_guidelines
contributing_guide -> has_contributing_guide

● Low

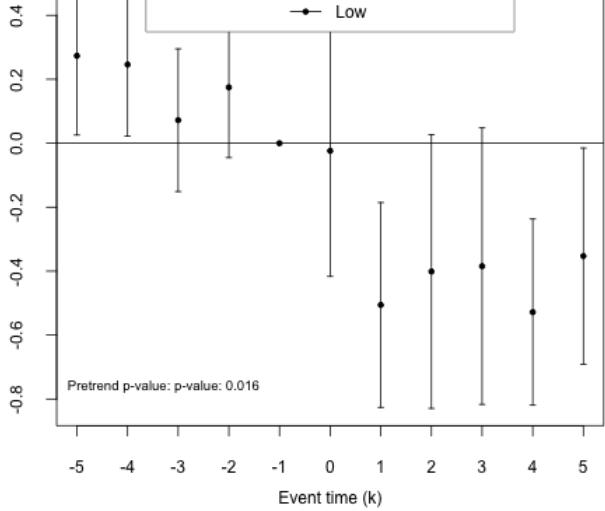


overall_new_release_count rolling5

Sample: num-qualified=1

organizational_routines -> newcomer_guidelines
contributing_guide -> has_contributing_guide

● Low

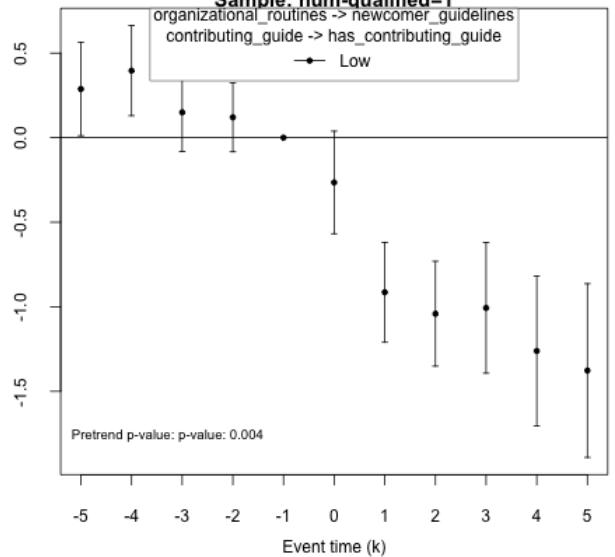


pull_request_merged rolling5

Sample: num-qualified=1

organizational_routines -> newcomer_guidelines
contributing_guide -> has_contributing_guide

● Low

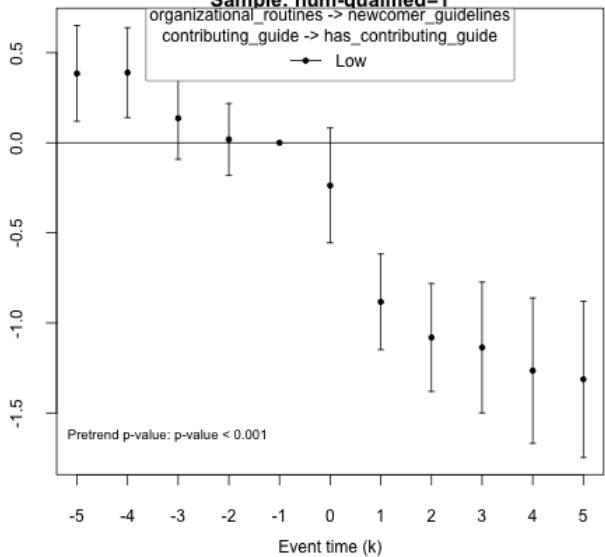


pull_request_opened rolling5

Sample: num-qualified=1

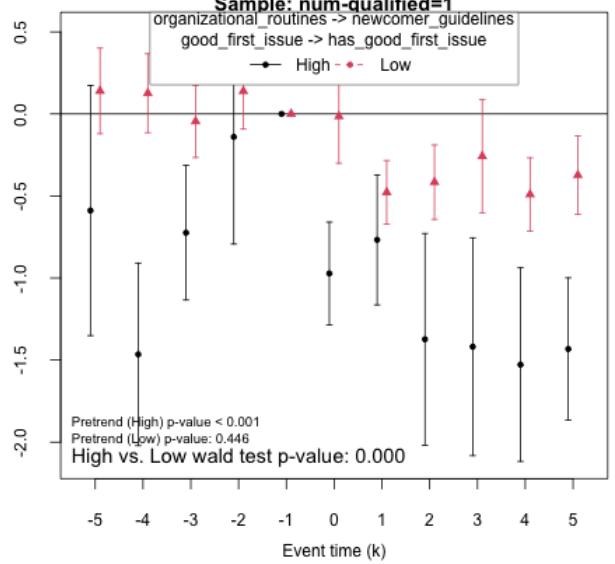
organizational_routines -> newcomer_guidelines
contributing_guide -> has_contributing_guide

● Low

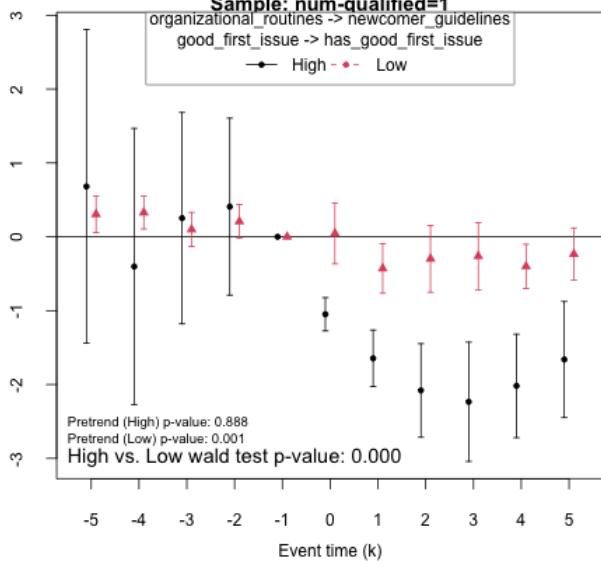


major_minor_release_count rolling5

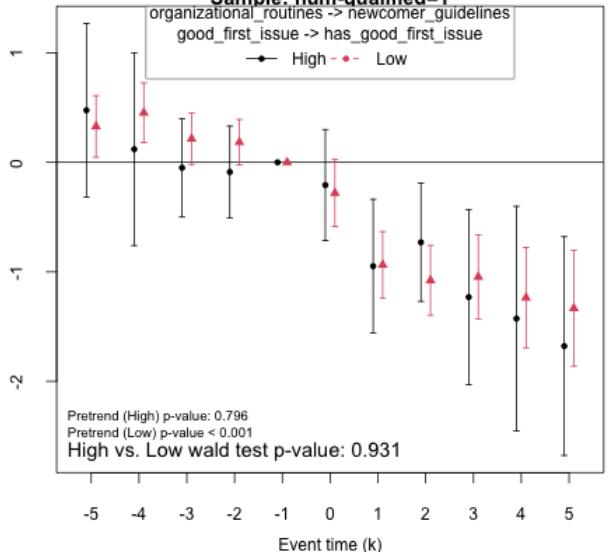
Sample: num-qualified=1

**overall_new_release_count rolling5**

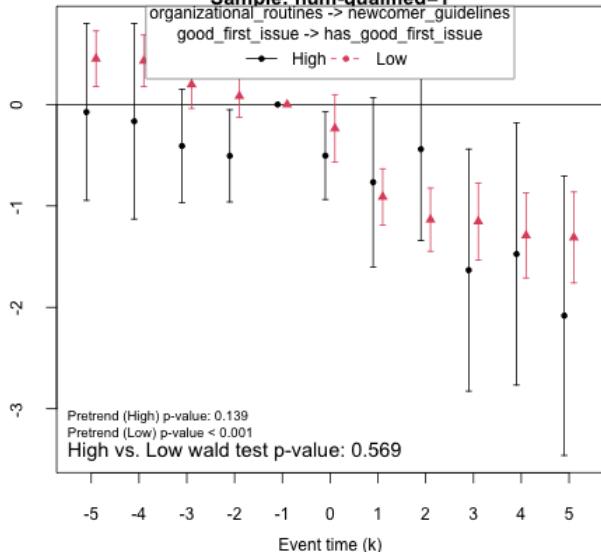
Sample: num-qualified=1

**pull_request_merged rolling5**

Sample: num-qualified=1

**pull_request_opened rolling5**

Sample: num-qualified=1

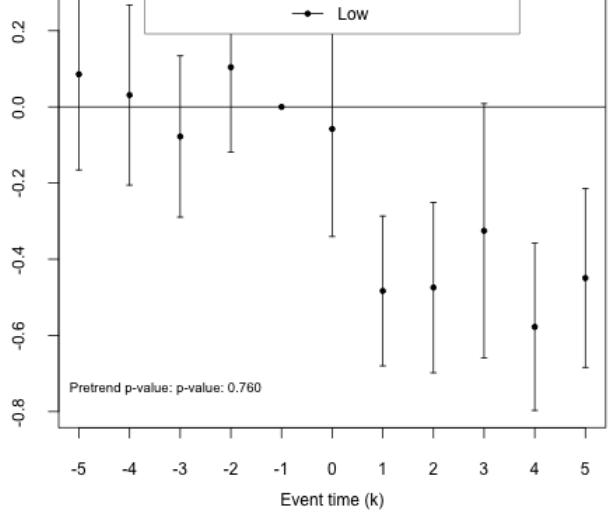


major_minor_release_count rolling5

Sample: num-qualified=1

organizational_routines -> organized_assignment
codeowners_file -> has_codeowners

● Low

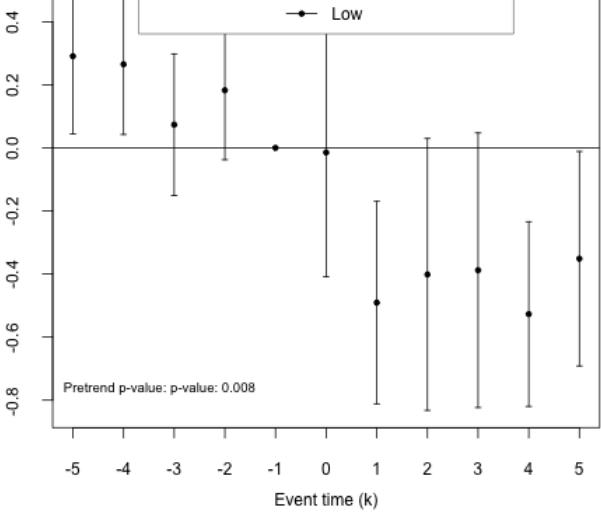


overall_new_release_count rolling5

Sample: num-qualified=1

organizational_routines -> organized_assignment
codeowners_file -> has_codeowners

● Low

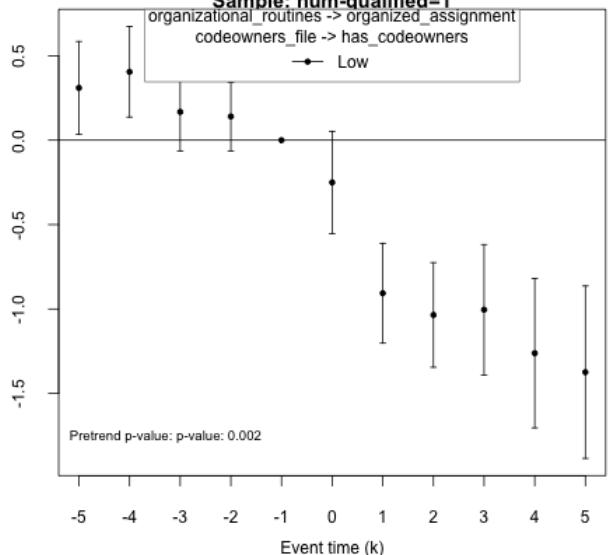


pull_request_merged rolling5

Sample: num-qualified=1

organizational_routines -> organized_assignment
codeowners_file -> has_codeowners

● Low

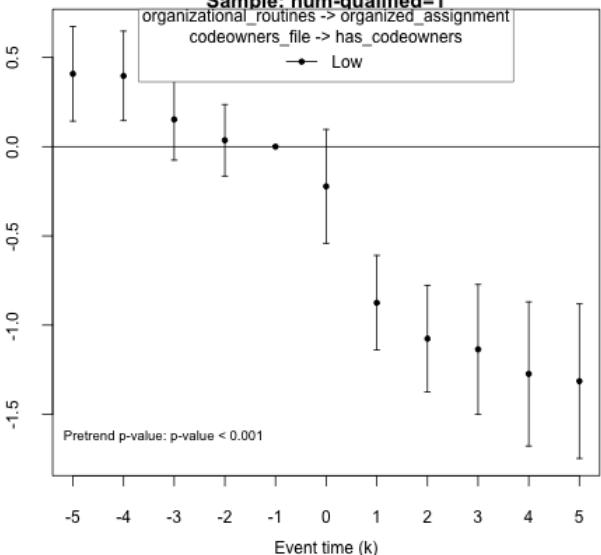


pull_request_opened rolling5

Sample: num-qualified=1

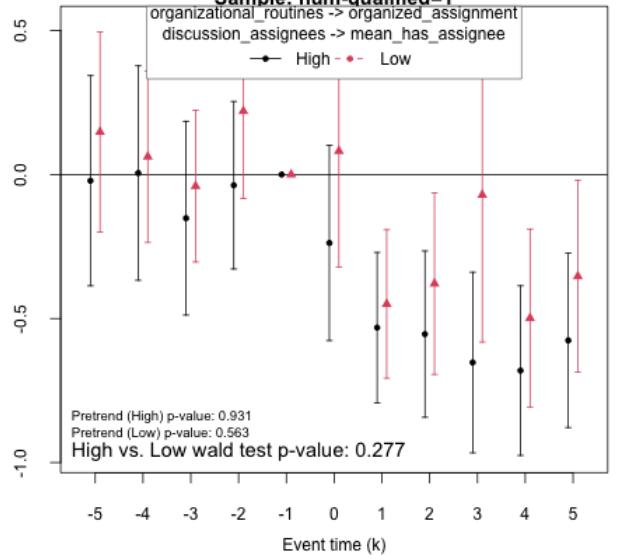
organizational_routines -> organized_assignment
codeowners_file -> has_codeowners

● Low

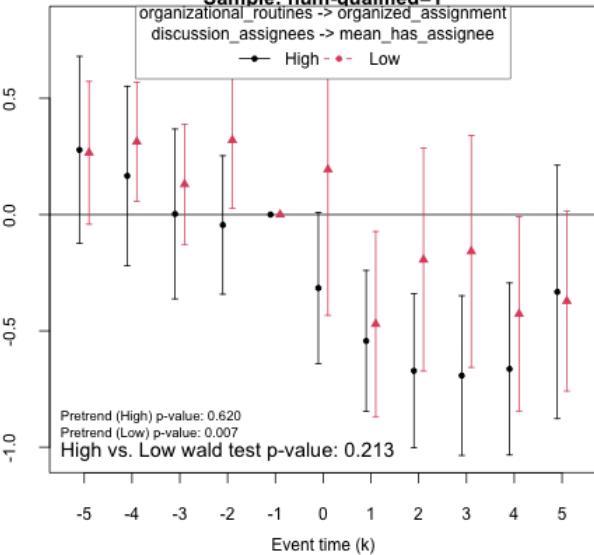


major_minor_release_count rolling5

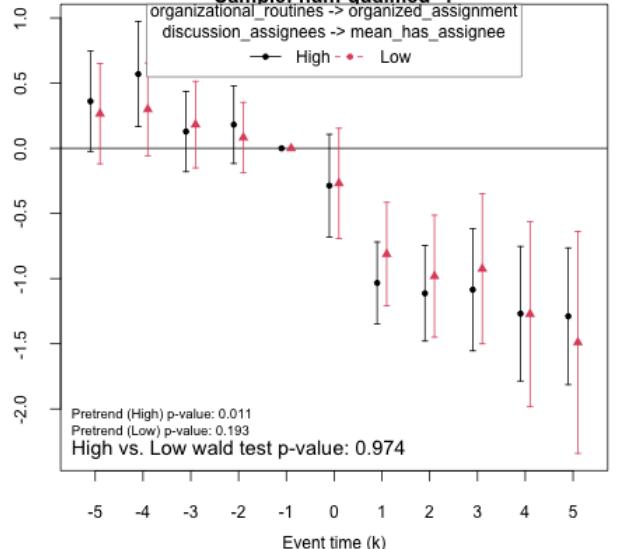
Sample: num-qualified=1

**overall_new_release_count rolling5**

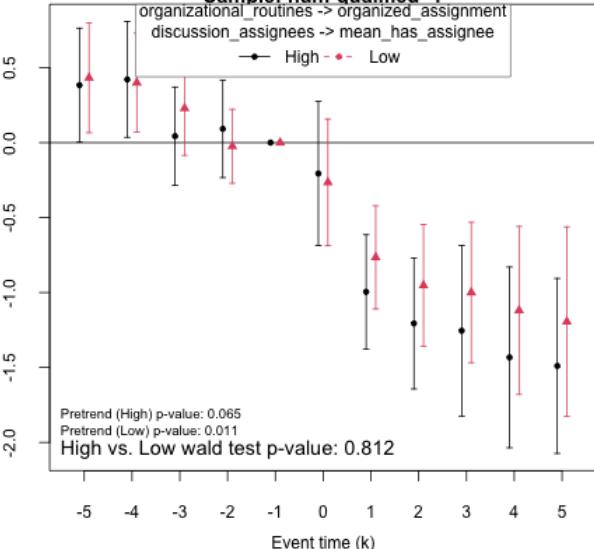
Sample: num-qualified=1

**pull_request_merged rolling5**

Sample: num-qualified=1

**pull_request_opened rolling5**

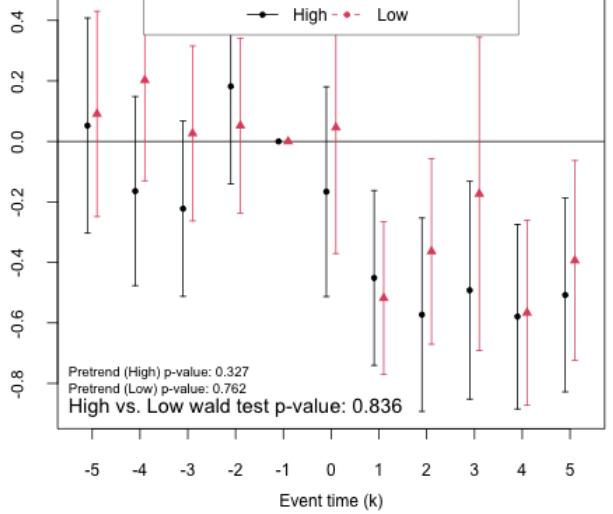
Sample: num-qualified=1



major_minor_release_count rolling5

Sample: num-qualified=1

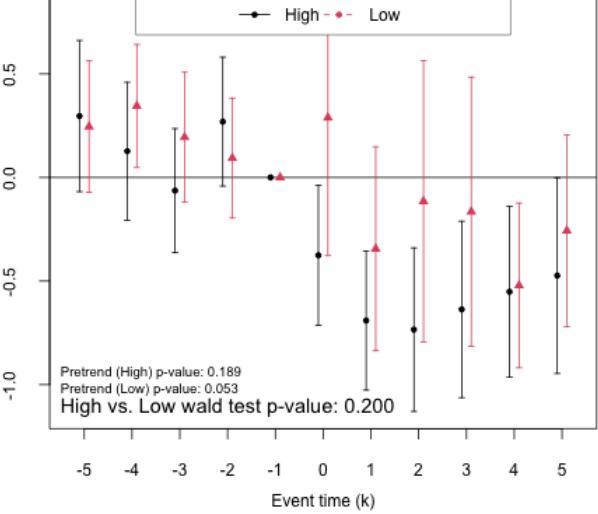
organizational_routines -> organized_assignment
discussion_labels -> mean_has_tag



overall_new_release_count rolling5

Sample: num-qualified=1

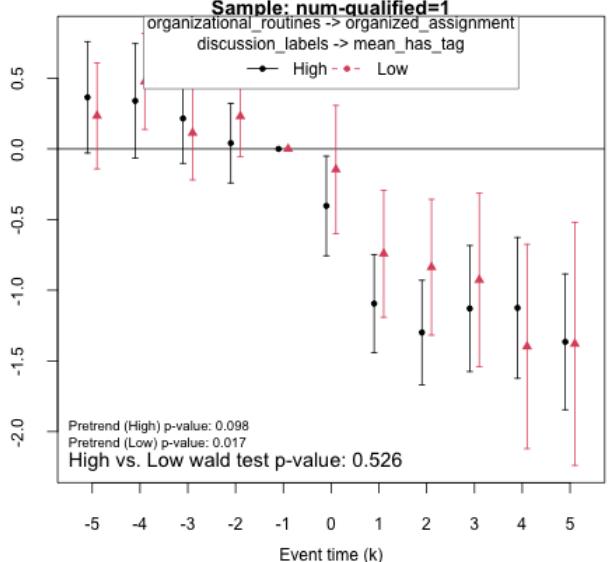
organizational_routines -> organized_assignment
discussion_labels -> mean_has_tag



pull_request_merged rolling5

Sample: num-qualified=1

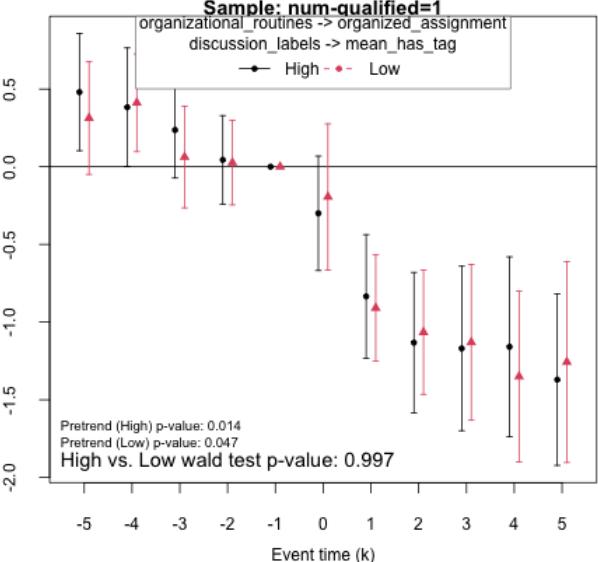
organizational_routines -> organized_assignment
discussion_labels -> mean_has_tag



pull_request_opened rolling5

Sample: num-qualified=1

organizational_routines -> organized_assignment
discussion_labels -> mean_has_tag



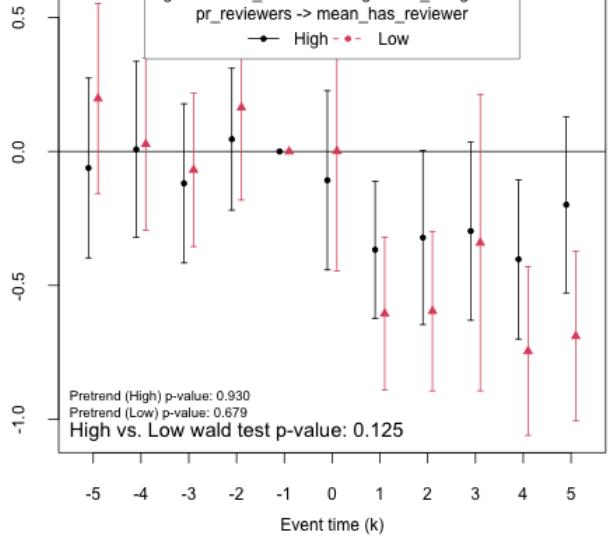
major_minor_release_count rolling5

Sample: num-qualified=1

organizational_routines -> organized_assignment

pr_reviewers -> mean_has_reviewer

● High ▲ Low

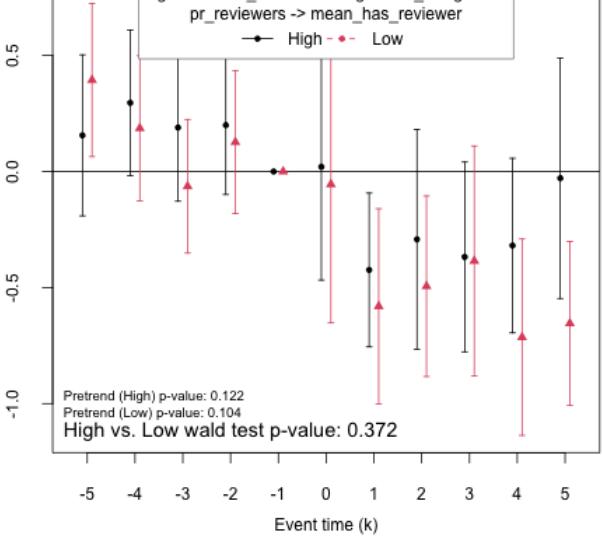
**overall_new_release_count rolling5**

Sample: num-qualified=1

organizational_routines -> organized_assignment

pr_reviewers -> mean_has_reviewer

● High ▲ Low

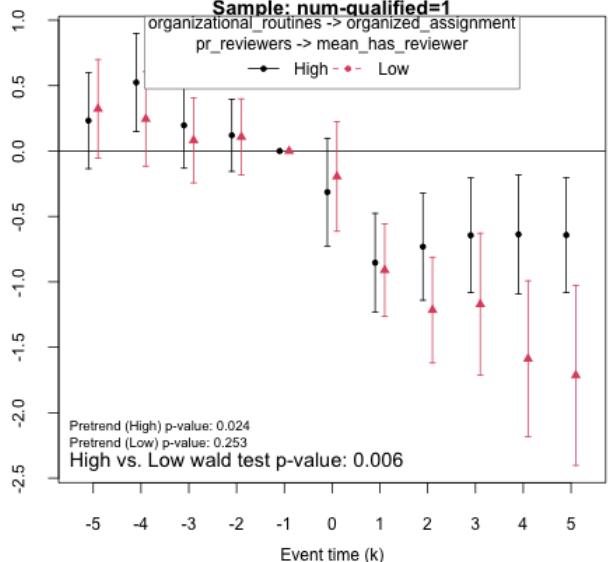
**pull_request_merged rolling5**

Sample: num-qualified=1

organizational_routines -> organized_assignment

pr_reviewers -> mean_has_reviewer

● High ▲ Low

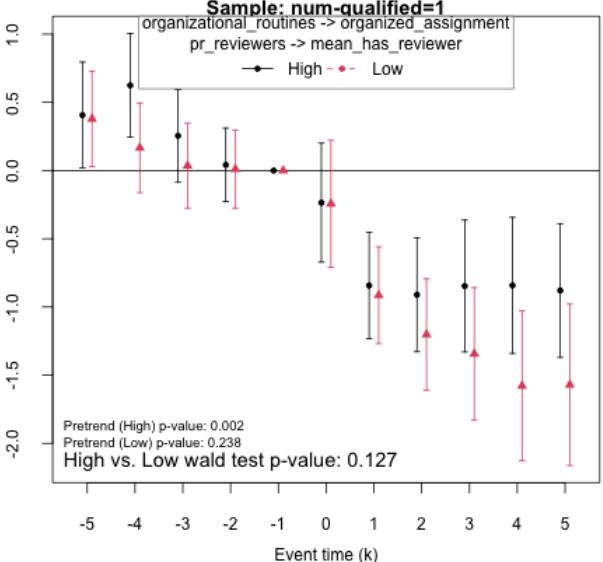
**pull_request_opened rolling5**

Sample: num-qualified=1

organizational_routines -> organized_assignment

pr_reviewers -> mean_has_reviewer

● High ▲ Low



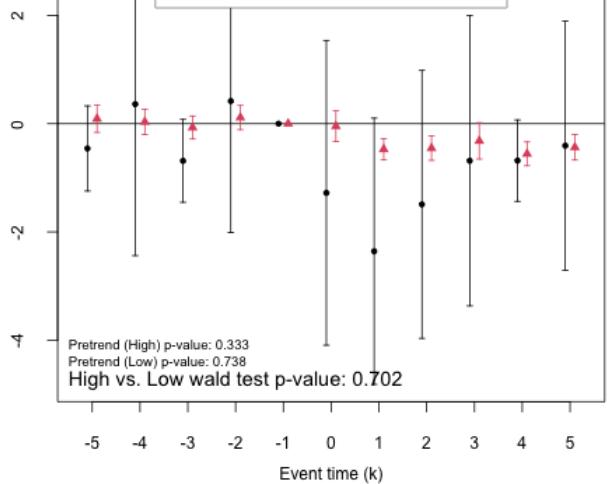
major_minor_release_count rolling5

Sample: num-qualified=1

organizational_routines -> organized_inquiries

issue_template -> has_issue_template

● High - ● Low



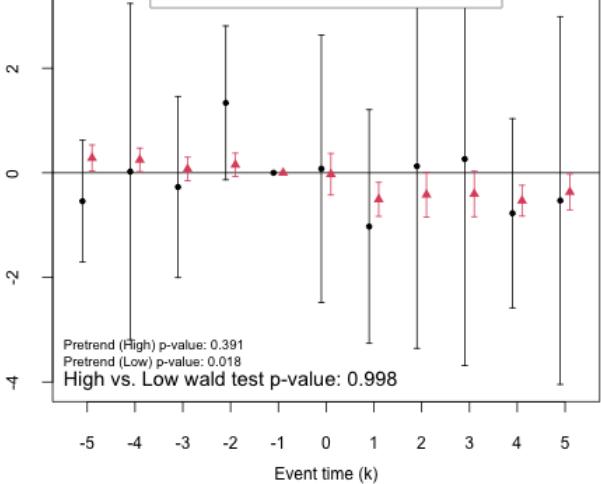
overall_new_release_count rolling5

Sample: num-qualified=1

organizational_routines -> organized_inquiries

issue_template -> has_issue_template

● High - ● Low



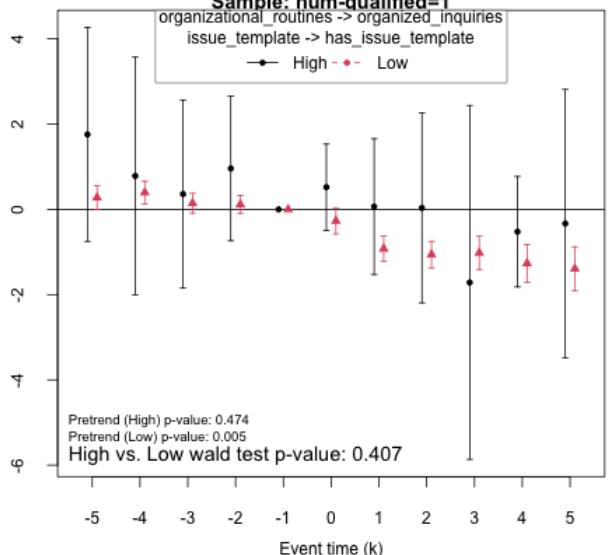
pull_request_merged rolling5

Sample: num-qualified=1

organizational_routines -> organized_inquiries

issue_template -> has_issue_template

● High - ● Low



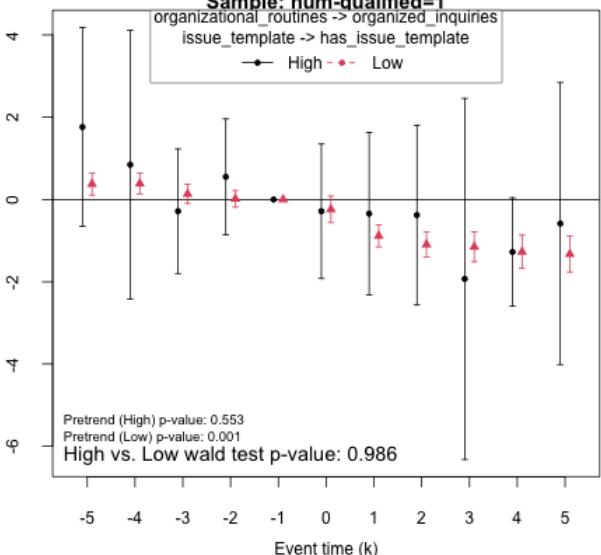
pull_request_opened rolling5

Sample: num-qualified=1

organizational_routines -> organized_inquiries

issue_template -> has_issue_template

● High - ● Low



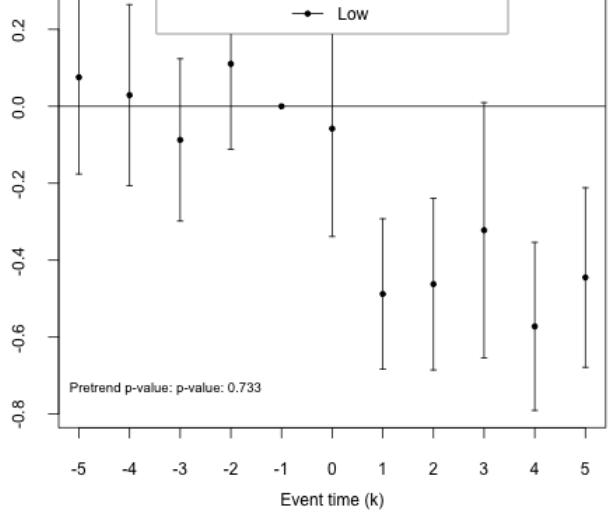
major_minor_release_count rolling5

Sample: num-qualified=1

organizational_routines -> organized_inquiries

pr_template -> has_pr_template

● Low



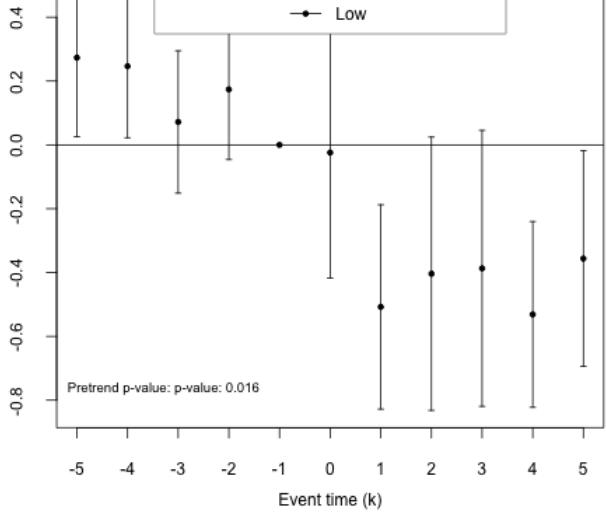
overall_new_release_count rolling5

Sample: num-qualified=1

organizational_routines -> organized_inquiries

pr_template -> has_pr_template

● Low



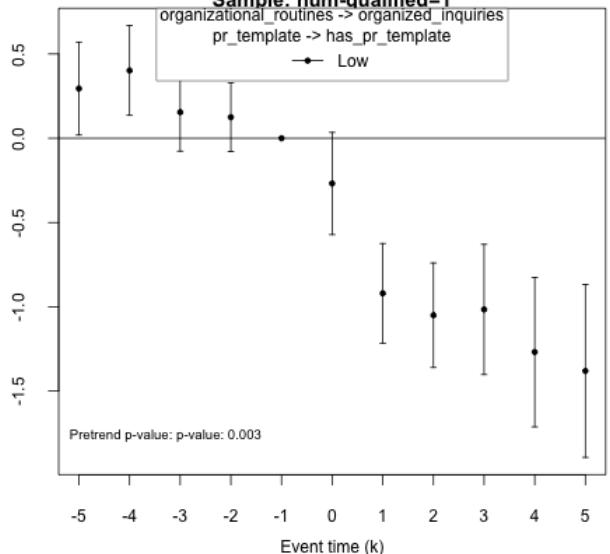
pull_request_merged rolling5

Sample: num-qualified=1

organizational_routines -> organized_inquiries

pr_template -> has_pr_template

● Low



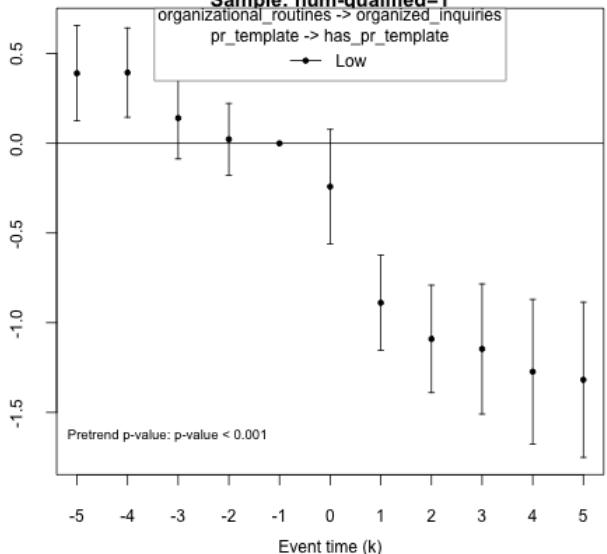
pull_request_opened rolling5

Sample: num-qualified=1

organizational_routines -> organized_inquiries

pr_template -> has_pr_template

● Low

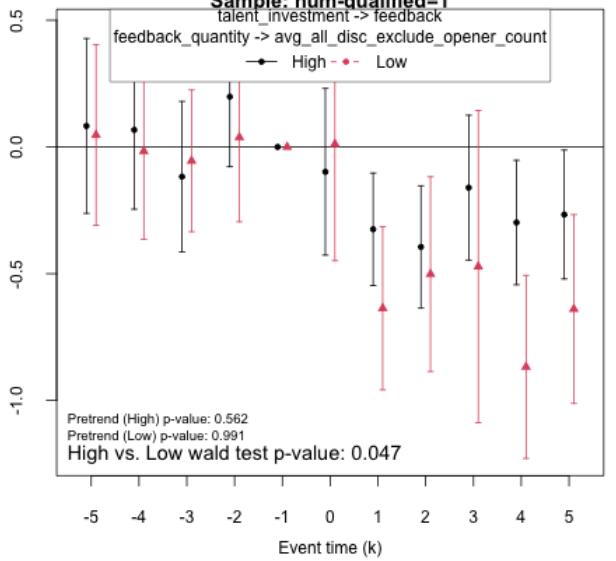


major_minor_release_count rolling5

Sample: num-qualified=1

talent_investment -> feedback
feedback_quantity -> avg_all_disc_exclude_opener_count

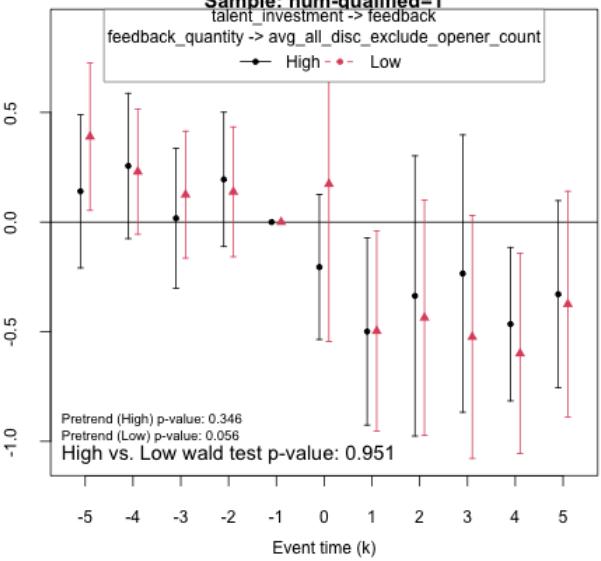
● High ▲ Low

**overall_new_release_count rolling5**

Sample: num-qualified=1

talent_investment -> feedback
feedback_quantity -> avg_all_disc_exclude_opener_count

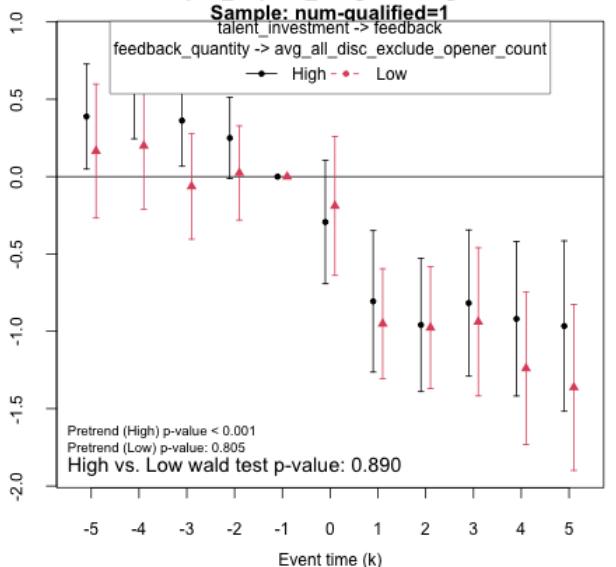
● High ▲ Low

**pull_request_merged rolling5**

Sample: num-qualified=1

talent_investment -> feedback
feedback_quantity -> avg_all_disc_exclude_opener_count

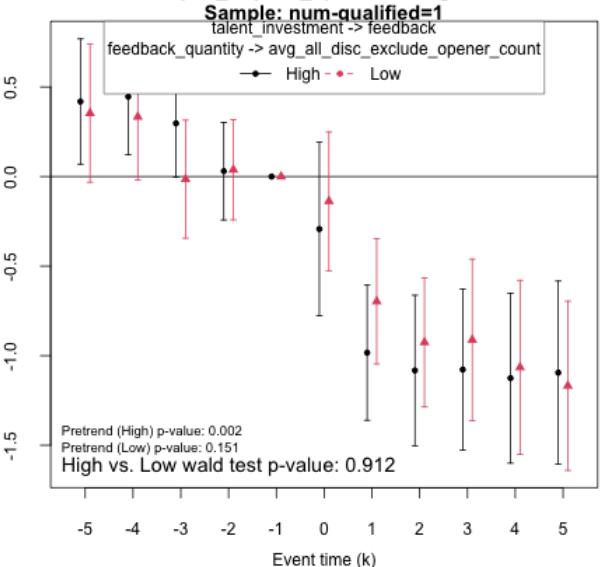
● High ▲ Low

**pull_request_opened rolling5**

Sample: num-qualified=1

talent_investment -> feedback
feedback_quantity -> avg_all_disc_exclude_opener_count

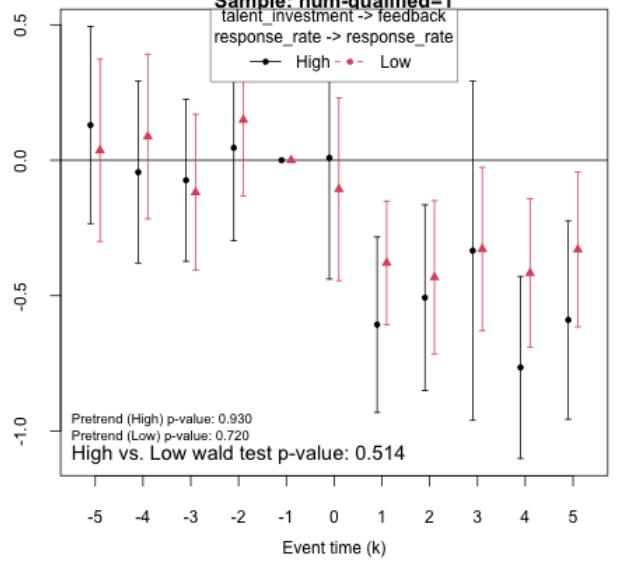
● High ▲ Low



major_minor_release_count rolling5

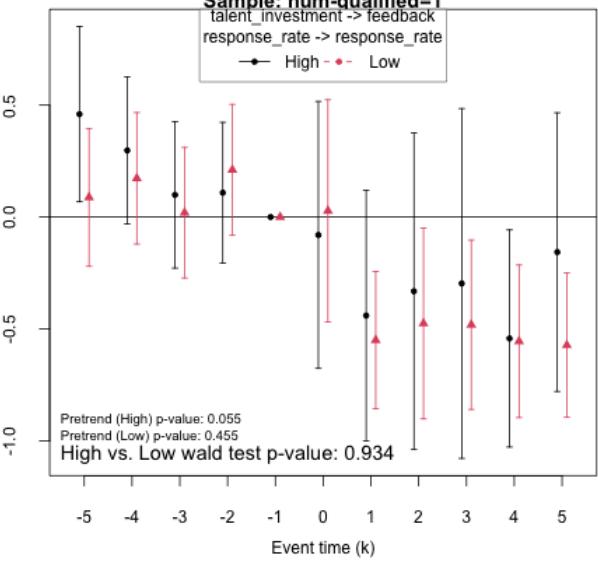
Sample: num-qualified=1

talent_investment -> feedback
 response_rate -> response_rate
 ● High ▲ Low

**overall_new_release_count rolling5**

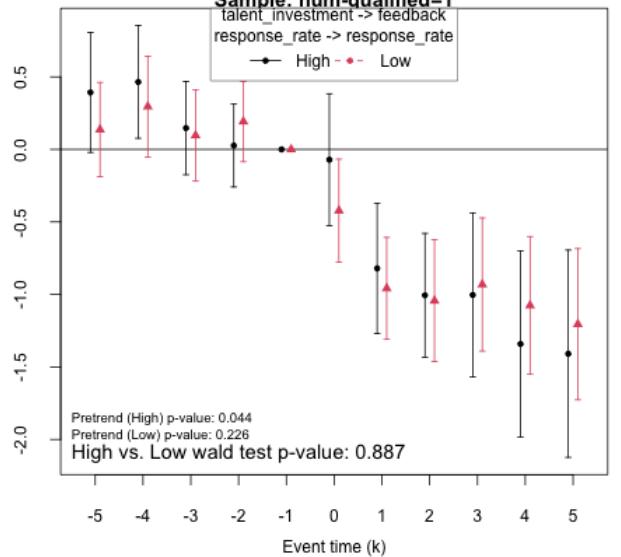
Sample: num-qualified=1

talent_investment -> feedback
 response_rate -> response_rate
 ● High ▲ Low

**pull_request_merged rolling5**

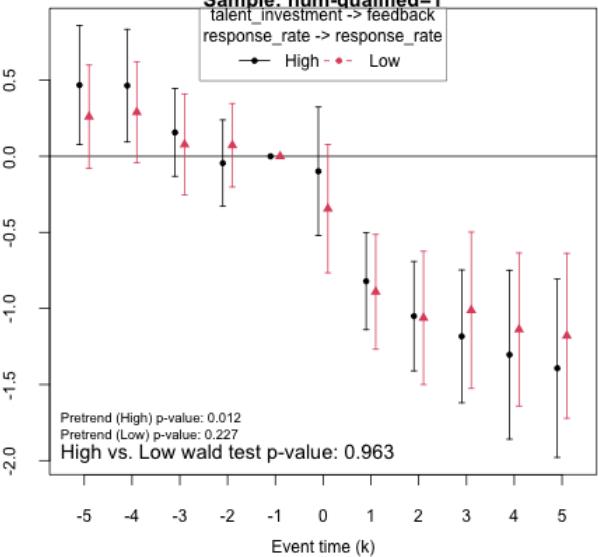
Sample: num-qualified=1

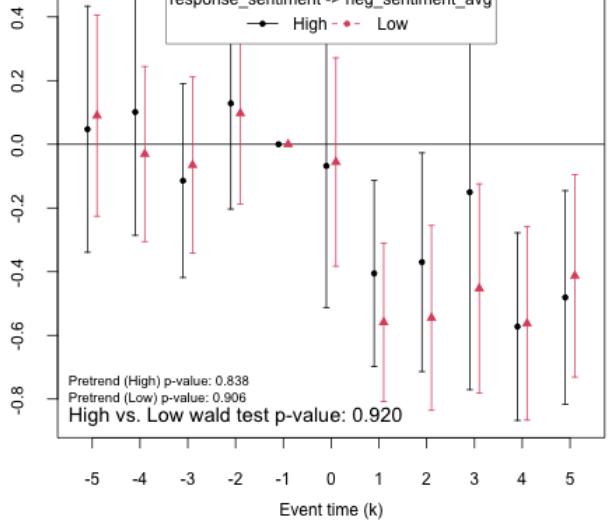
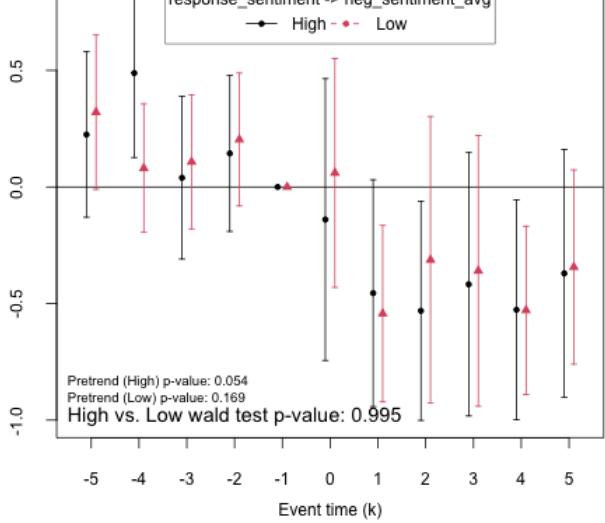
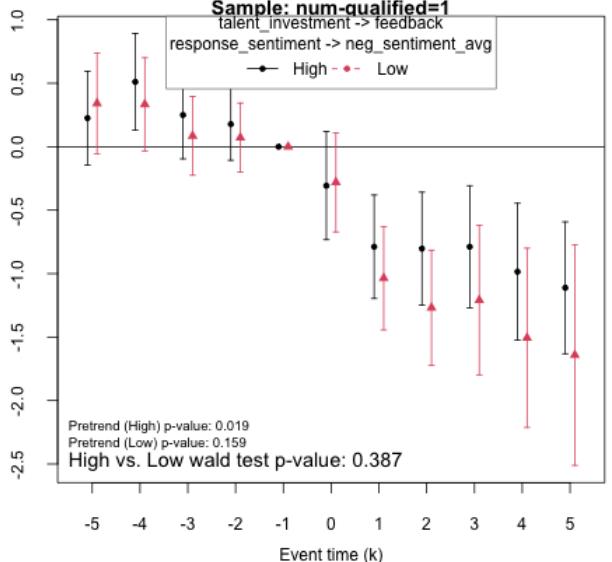
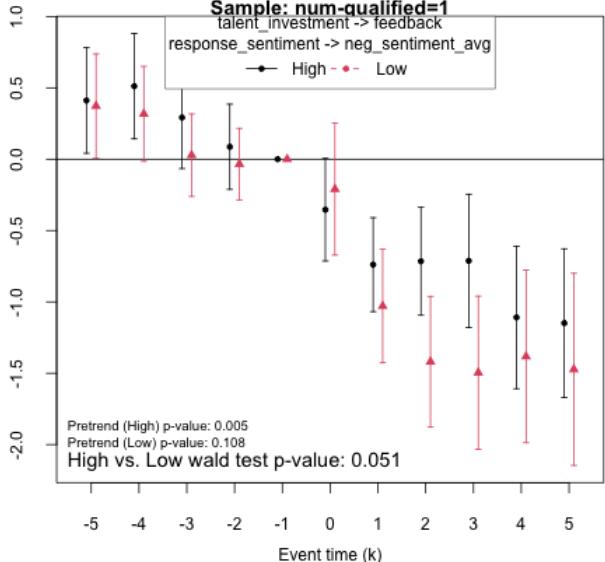
talent_investment -> feedback
 response_rate -> response_rate
 ● High ▲ Low

**pull_request_opened rolling5**

Sample: num-qualified=1

talent_investment -> feedback
 response_rate -> response_rate
 ● High ▲ Low

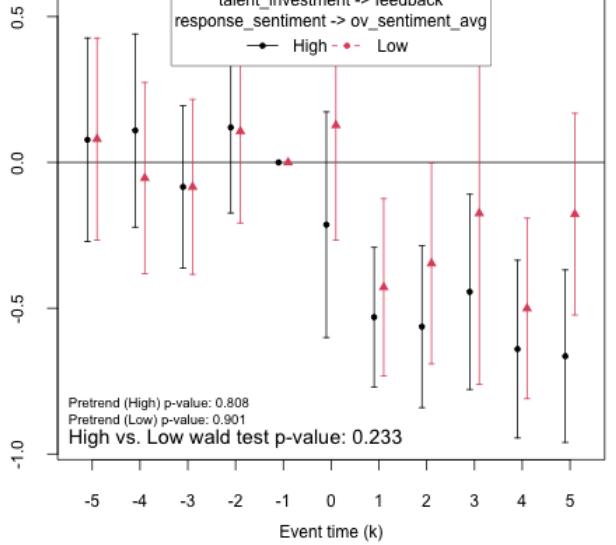


major_minor_release_count rolling5**Sample: num-qualified=1**talent_investment -> feedback
response_sentiment -> neg_sentiment_avg**overall_new_release_count rolling5****Sample: num-qualified=1**talent_investment -> feedback
response_sentiment -> neg_sentiment_avg**pull_request_merged rolling5****Sample: num-qualified=1**talent_investment -> feedback
response_sentiment -> neg_sentiment_avg**pull_request_opened rolling5****Sample: num-qualified=1**talent_investment -> feedback
response_sentiment -> neg_sentiment_avg

major_minor_release_count rolling5

Sample: num-qualified=1

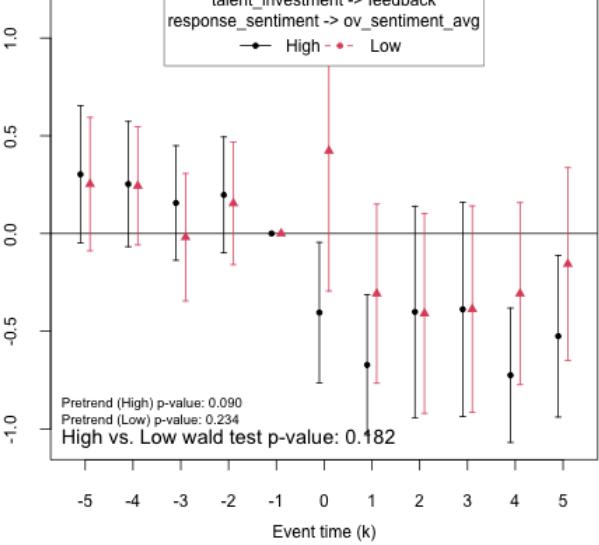
talent_investment -> feedback
response_sentiment -> ov_sentiment_avg



overall_new_release_count rolling5

Sample: num-qualified=1

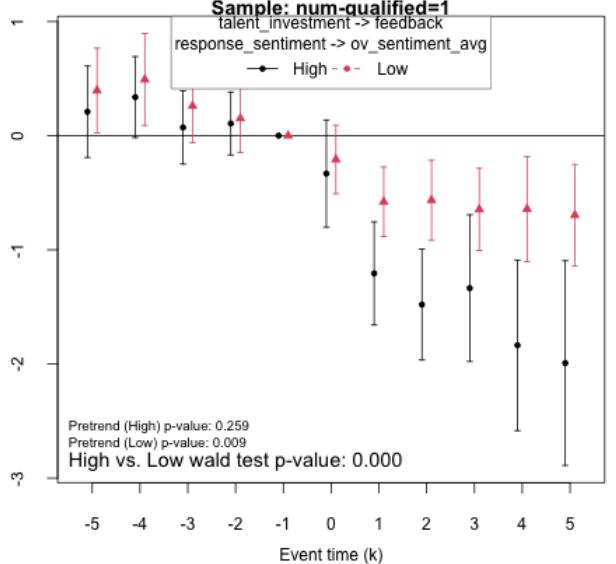
talent_investment -> feedback
response_sentiment -> ov_sentiment_avg



pull_request_merged rolling5

Sample: num-qualified=1

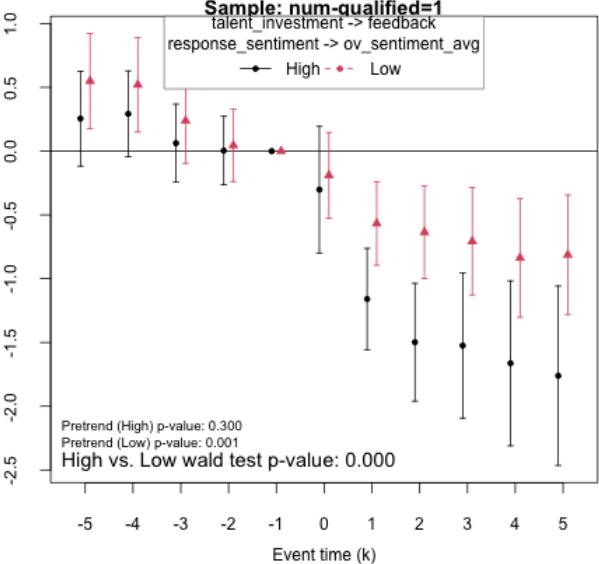
talent_investment -> feedback
response_sentiment -> ov_sentiment_avg



pull_request_opened rolling5

Sample: num-qualified=1

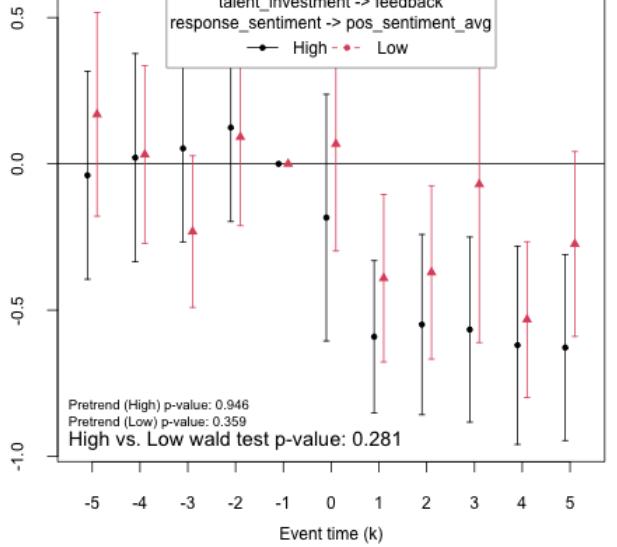
talent_investment -> feedback
response_sentiment -> ov_sentiment_avg



major_minor_release_count rolling5

Sample: num-qualified=1

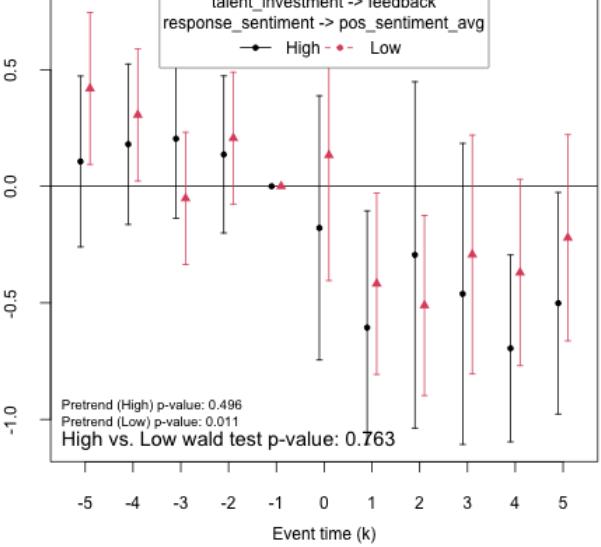
talent_investment -> feedback
response_sentiment -> pos_sentiment_avg



overall_new_release_count rolling5

Sample: num-qualified=1

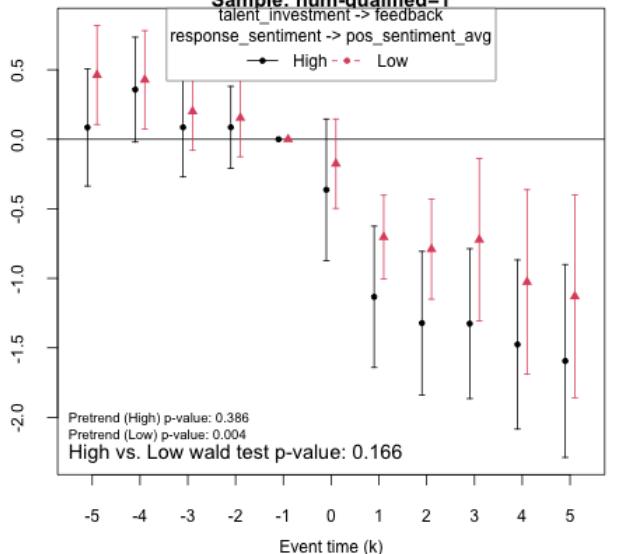
talent_investment -> feedback
response_sentiment -> pos_sentiment_avg



pull_request_merged rolling5

Sample: num-qualified=1

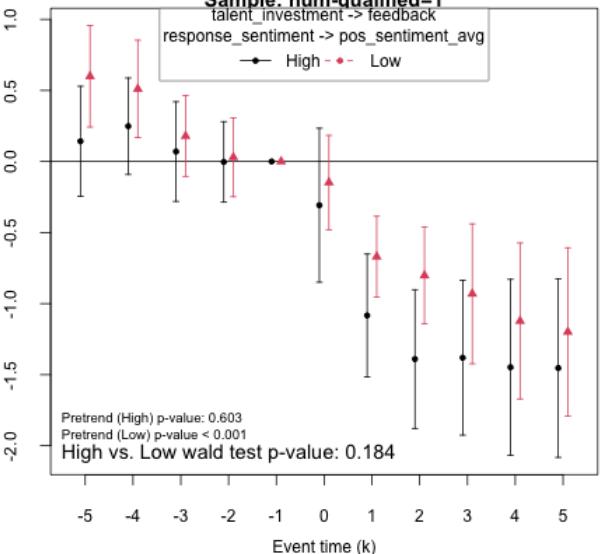
talent_investment -> feedback
response_sentiment -> pos_sentiment_avg



pull_request_opened rolling5

Sample: num-qualified=1

talent_investment -> feedback
response_sentiment -> pos_sentiment_avg

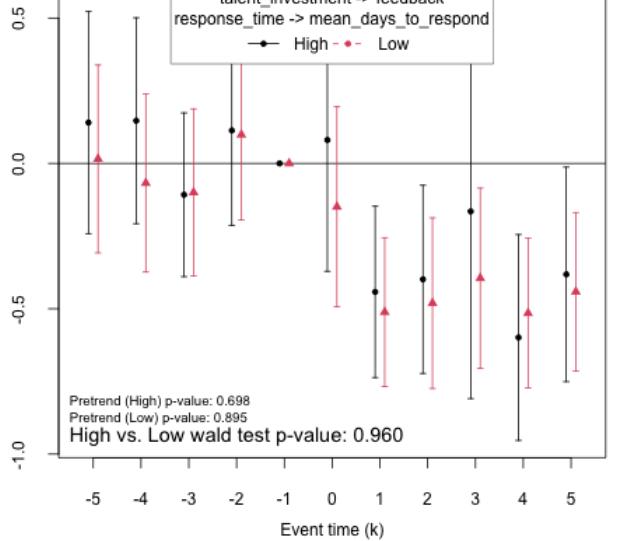


major_minor_release_count rolling5

Sample: num-qualified=1

talent_investment -> feedback
 response_time -> mean_days_to_respond

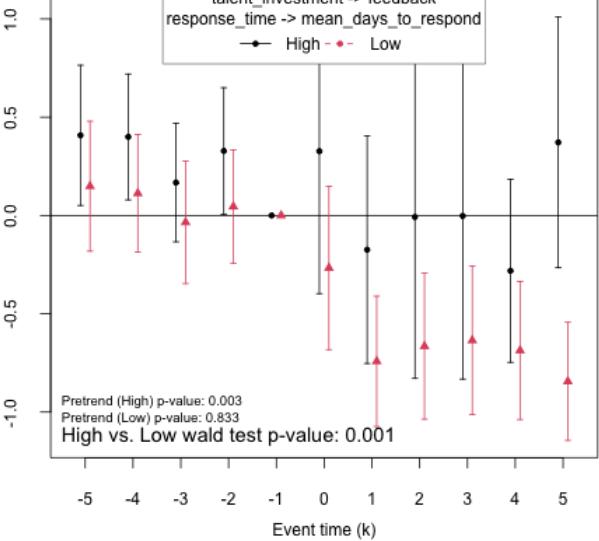
- High
- Low

**overall_new_release_count rolling5**

Sample: num-qualified=1

talent_investment -> feedback
 response_time -> mean_days_to_respond

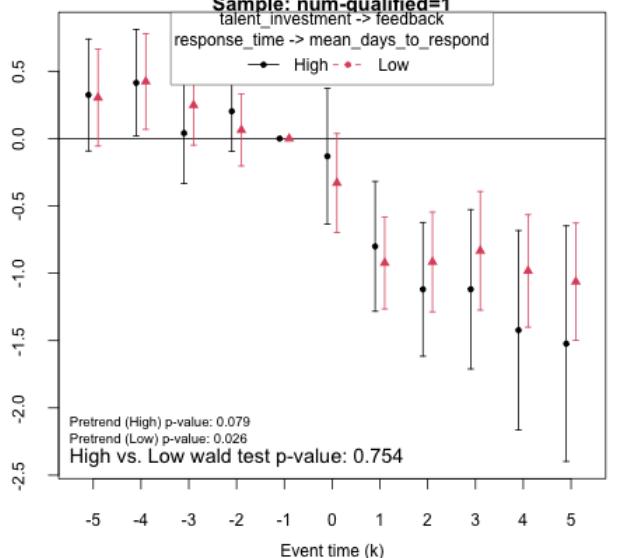
- High
- Low

**pull_request_merged rolling5**

Sample: num-qualified=1

talent_investment -> feedback
 response_time -> mean_days_to_respond

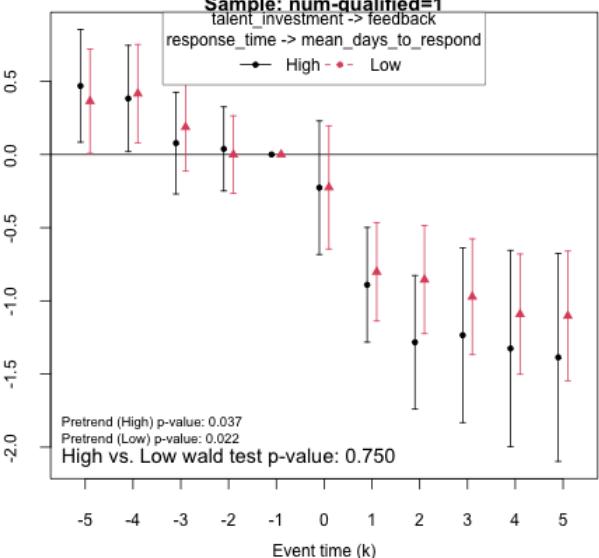
- High
- Low

**pull_request_opened rolling5**

Sample: num-qualified=1

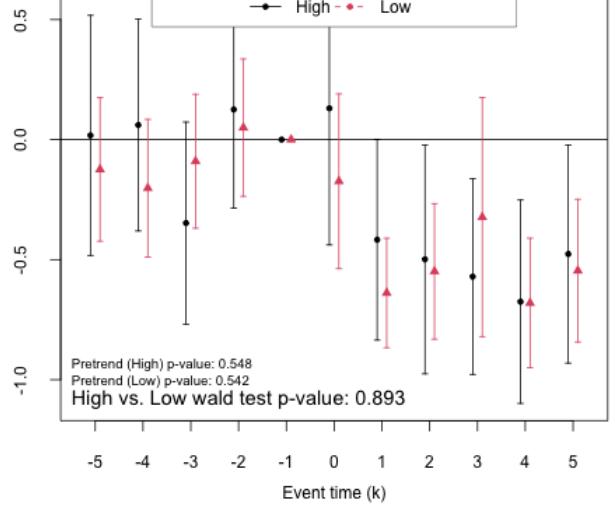
talent_investment -> feedback
 response_time -> mean_days_to_respond

- High
- Low

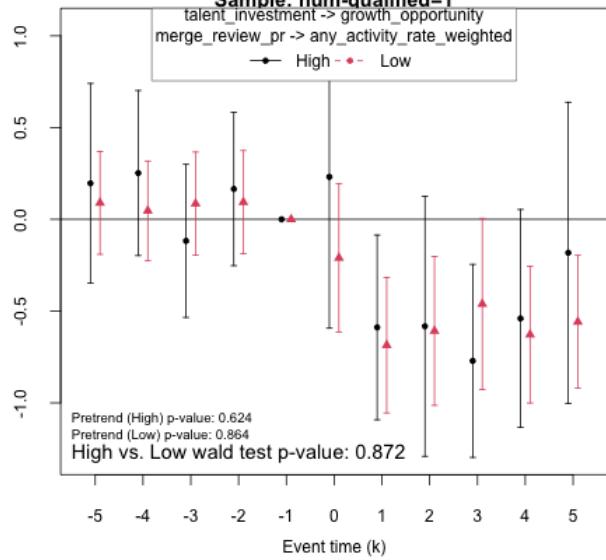


major_minor_release_count rolling5**Sample: num-qualified=1**

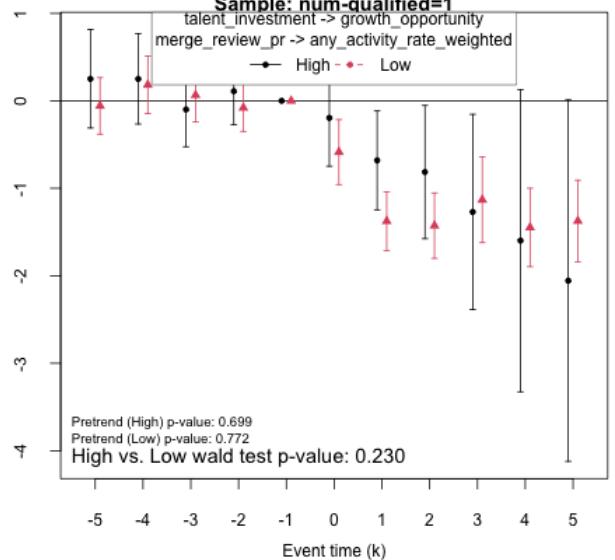
talent_investment->growth_opportunity
 merge_review_pr -> any_activity_rate_weighted
 ● High -● Low

**overall_new_release_count rolling5****Sample: num-qualified=1**

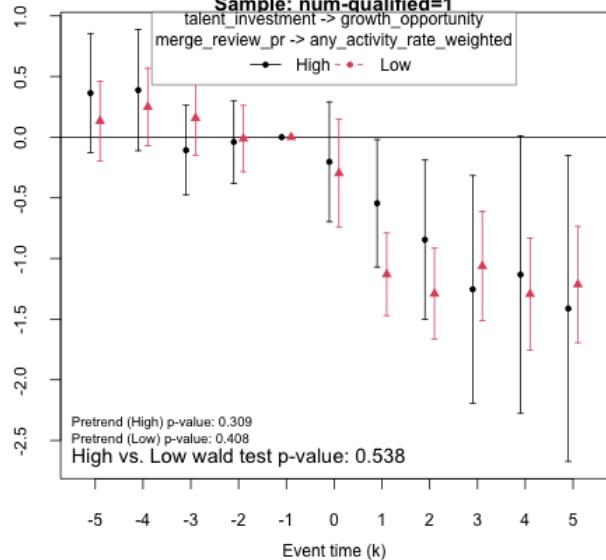
talent_investment->growth_opportunity
 merge_review_pr -> any_activity_rate_weighted
 ● High -● Low

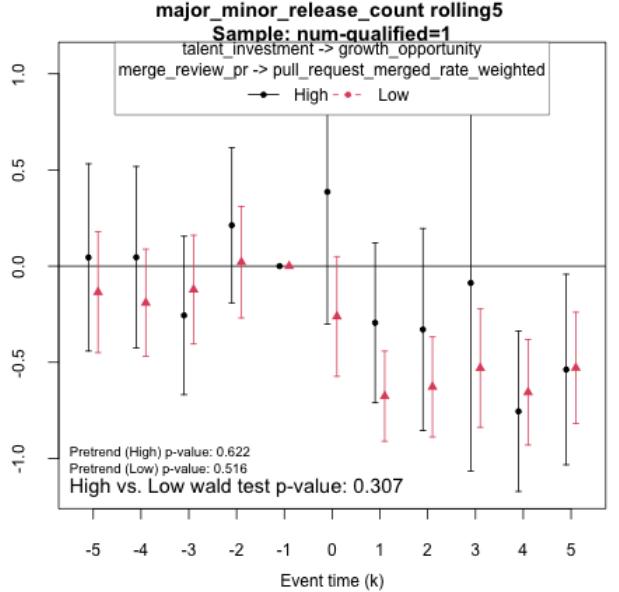
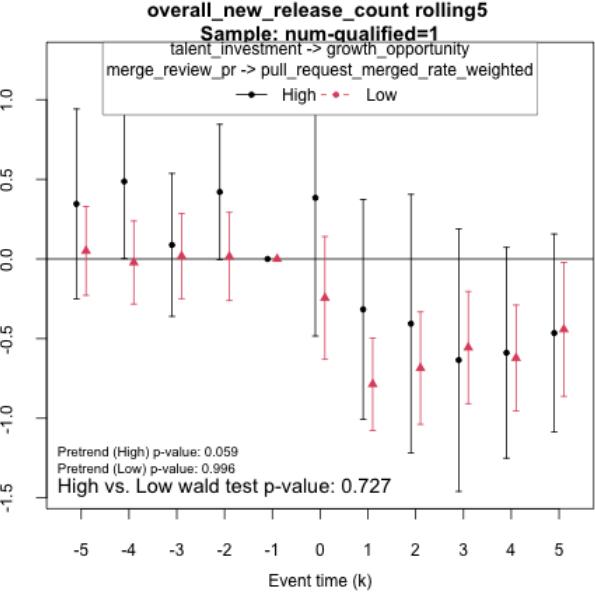
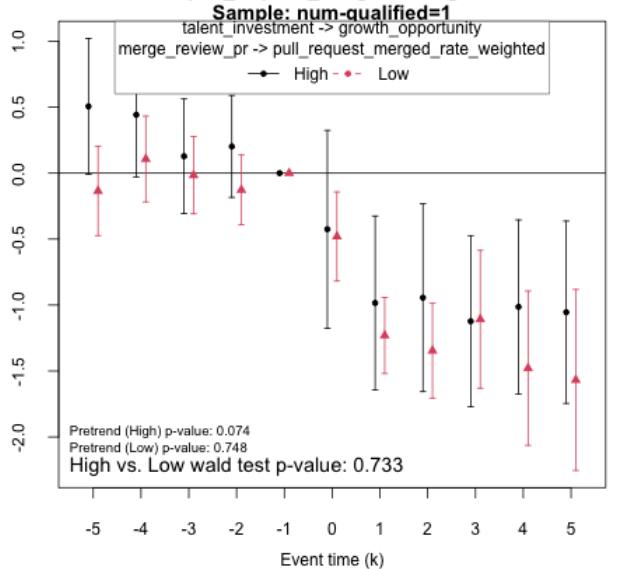
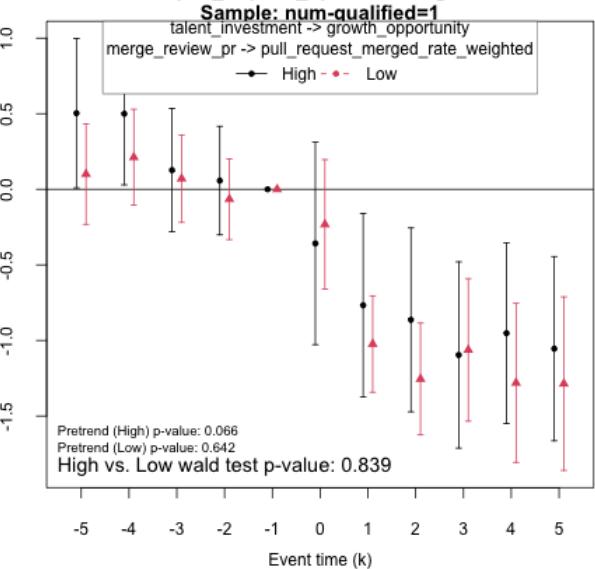
**pull_request_merged rolling5****Sample: num-qualified=1**

talent_investment->growth_opportunity
 merge_review_pr -> any_activity_rate_weighted
 ● High -● Low

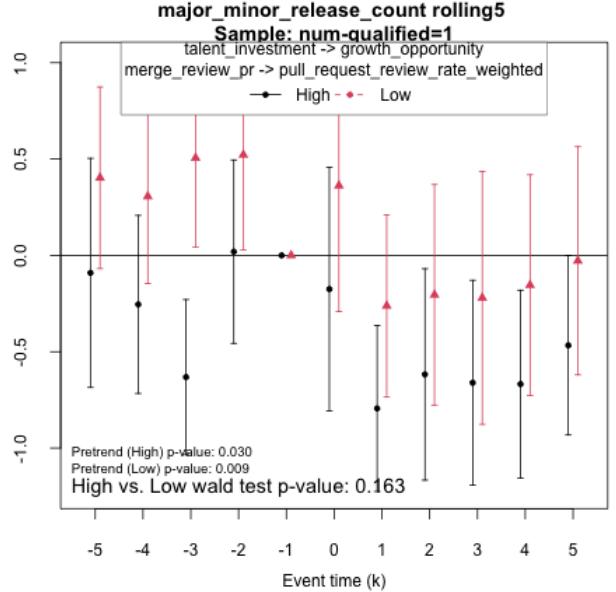
**pull_request_opened rolling5****Sample: num-qualified=1**

talent_investment->growth_opportunity
 merge_review_pr -> any_activity_rate_weighted
 ● High -● Low

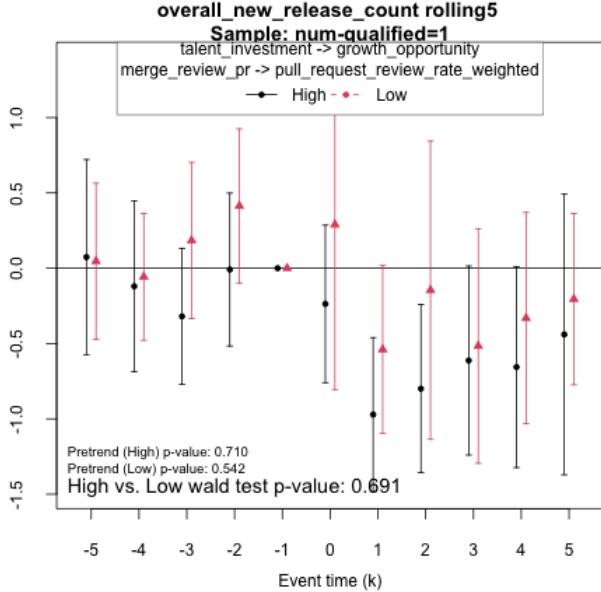


major_minor_release_count rolling5**overall_new_release_count rolling5****pull_request_merged rolling5****pull_request_opened rolling5**

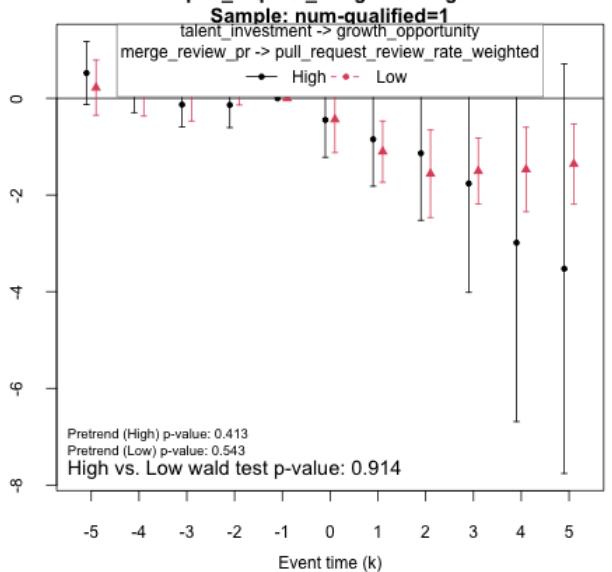
major_minor_release_count rolling5



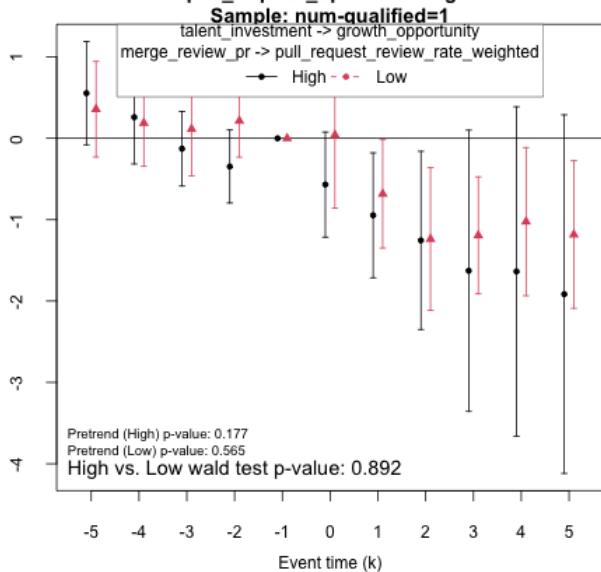
overall_new_release_count rolling5



pull_request_merged rolling5



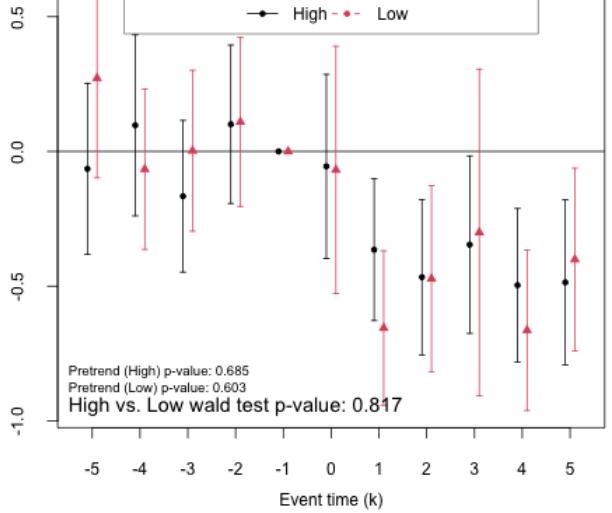
pull_request_opened rolling5



major_minor_release_count rolling5

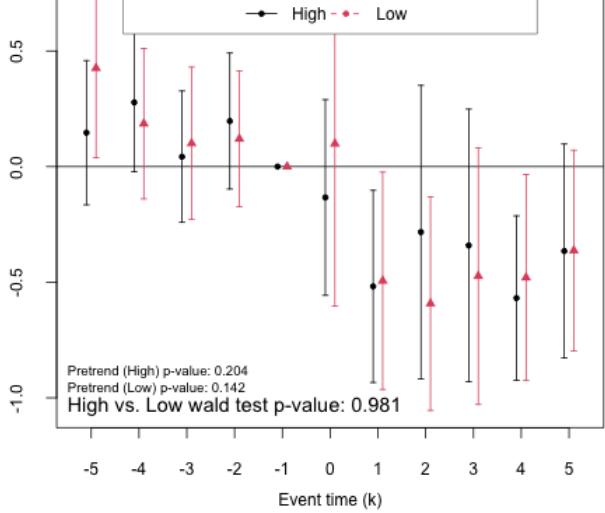
Sample: num-qualified=1

talent_investment -> organizational_closeness
 network_clustering_coefficient -> clustering_coefficient

**overall_new_release_count rolling5**

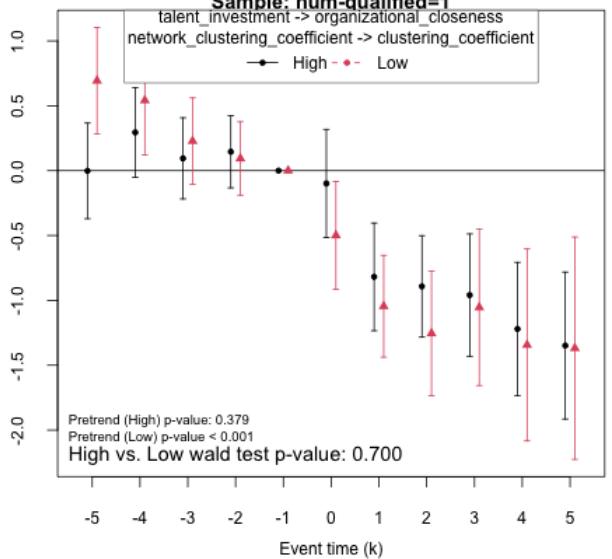
Sample: num-qualified=1

talent_investment -> organizational_closeness
 network_clustering_coefficient -> clustering_coefficient

**pull_request_merged rolling5**

Sample: num-qualified=1

talent_investment -> organizational_closeness
 network_clustering_coefficient -> clustering_coefficient

**pull_request_opened rolling5**

Sample: num-qualified=1

talent_investment -> organizational_closeness
 network_clustering_coefficient -> clustering_coefficient

