

Supplementary Information: SHAP Explanations for Multimodal Text-Tabular Models

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ABSTRACT

This is the supplementary information for SHAP Explanations for Multimodal Text-Tabular Models

Model Performance

		airbnb (acc)	channel (acc)	fake (roc)	imdb (roc)	jigsaw (roc)	kick (roc)	prod (acc)	salary (acc)	wine (acc)
BERT	WE ($w=.25$)	.416	.544	.887	.851	.927	.748	.891	.431	.796
	WE ($w=.50$)	.421	.543	.928	.861	.941	.782	.881	.467	.826
	WE ($w=.75$)	.404	.502	.939	.857	.949	.776	.785	.479	.825
	Stack-Ensemble	.364	.466	.905	.822	.931	.755	.730	*.239	*.072
	All-Text	.387	*.254	.962	.828	.961	.781	.905	.481	.826
DeBERTa	WE ($w=.25$)	.418	.544	.871	.857	.927	.747	.891	.438	.781
	WE ($w=.50$)	.418	.540	.908	.872	.936	.779	.884	.468	.811
	WE ($w=.75$)	.400	.445	.921	.859	.944	.769	.811	.476	.810
	Stack-Ensemble	.351	.447	.905	.820	.928	.738	.874	*.277	*.078
	All-Text	.377	*.317	.959	.797	.955	.776	.888	.458	.817
DistilBERT	WE ($w=.25$)	.420	.545	.874	.853	.932	.741	.891	.394	.793
	WE ($w=.50$)	.419	.546	.919	.865	.946	.774	.879	.450	.822
	WE ($w=.75$)	.389	.481	.934	.852	.951	.768	.797	.456	.822
	Stack-Ensemble	.372	.449	.909	.811	.916	.749	*.665	*.171	*.022
	All-Text	.380	*.319	.961	.815	.962	.788	.901	.458	.819
DistilRoBERTa	WE ($w=.25$)	.419	.544	.865	.846	.941	.741	.891	.435	.798
	WE ($w=.50$)	.414	.547	.908	.853	.955	.784	.885	.468	.825
	WE ($w=.75$)	.387	.488	.927	.831	.961	.783	.796	.471	.824
	Stack-Ensemble	.380	.459	.919	.831	.903	.770	.885	*.329	*.037
	All-Text	.390	*.313	.958	.772	.964	.795	.904	.471	.821

Table 1. Table of Results. * indicates models that are excluded from explanation analysis due to poor performance relative to dataset peers. WE: Weighted-Ensemble

Comparing Combination Methods and Text Models

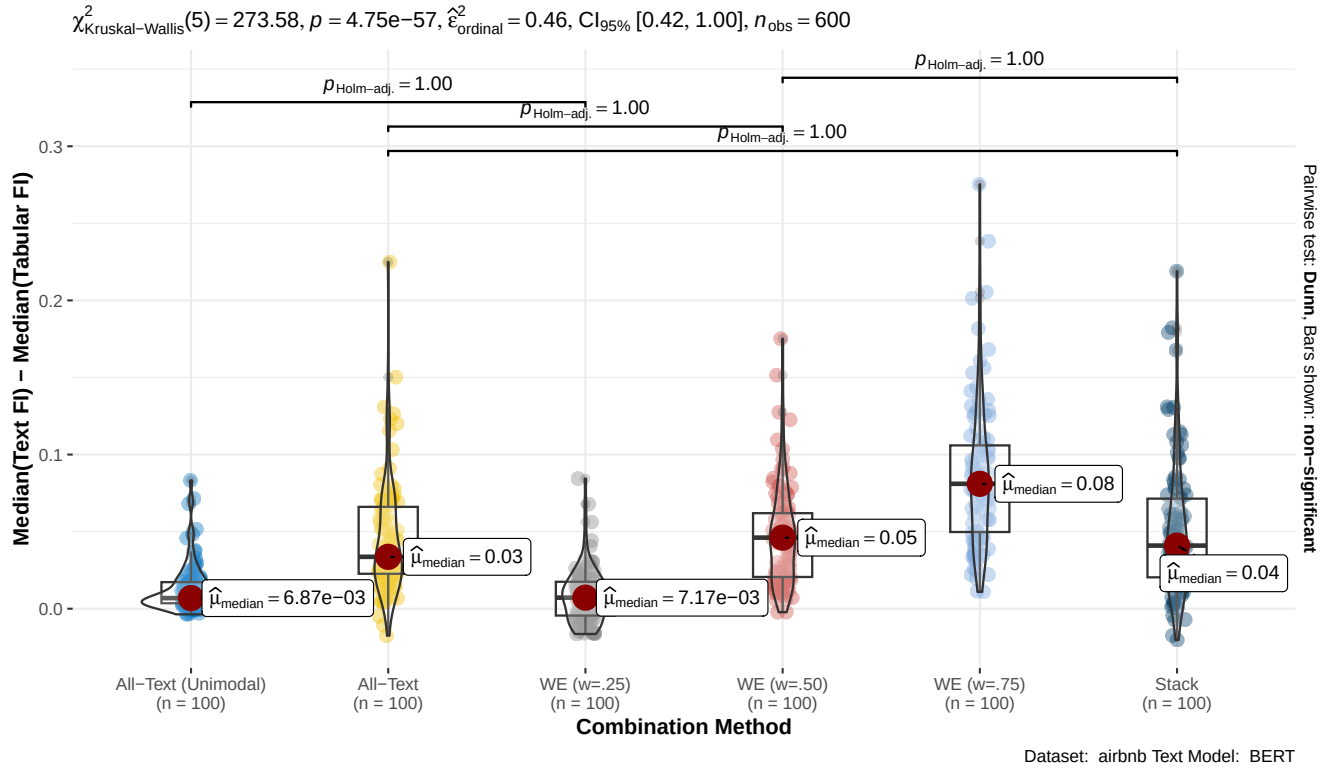


Figure 1. Median Text and Tabular Feature Importances Compared, by Combination Method, on the *airbnb* dataset with BERT text model. WE: *Weighted-Ensemble*.

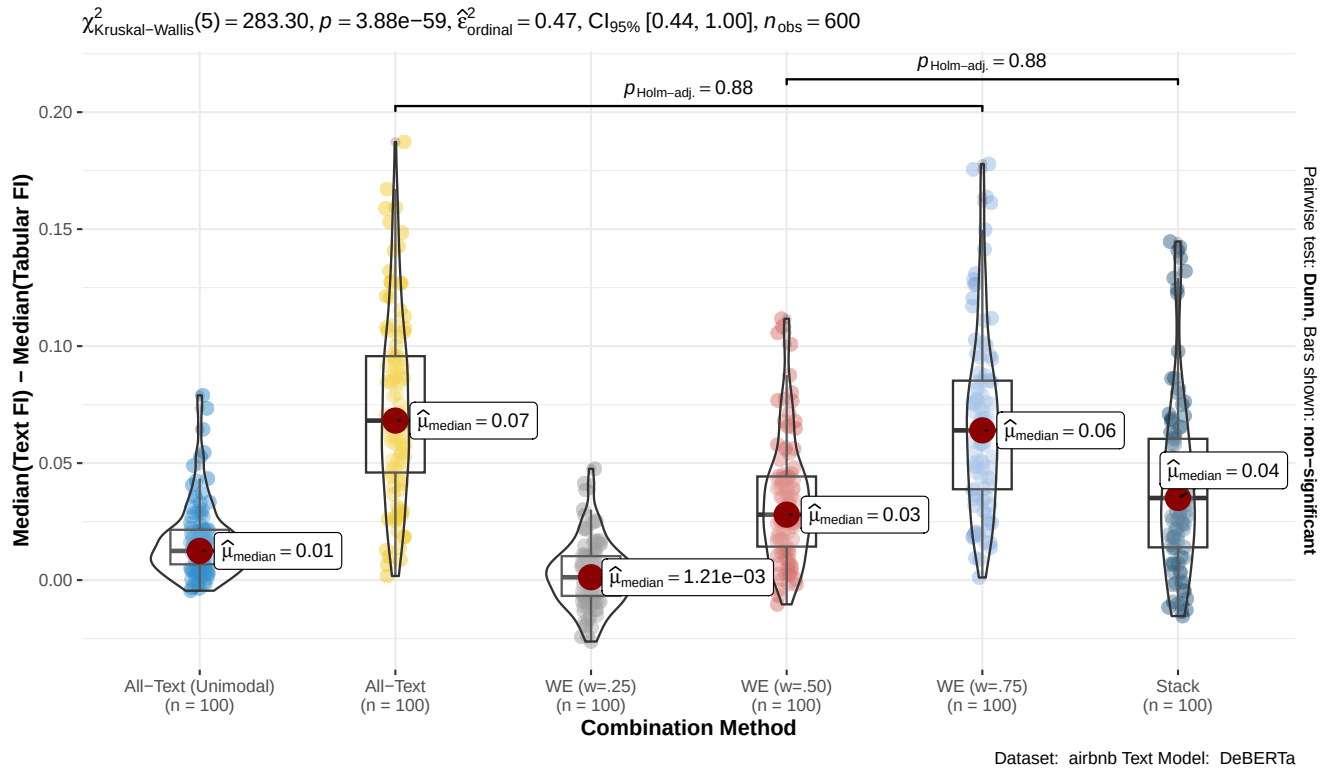


Figure 2. Median Text and Tabular Feature Importances Compared, by Combination Method, on the *airbnb* dataset with DeBERTa text model. WE: *Weighted-Ensemble*.

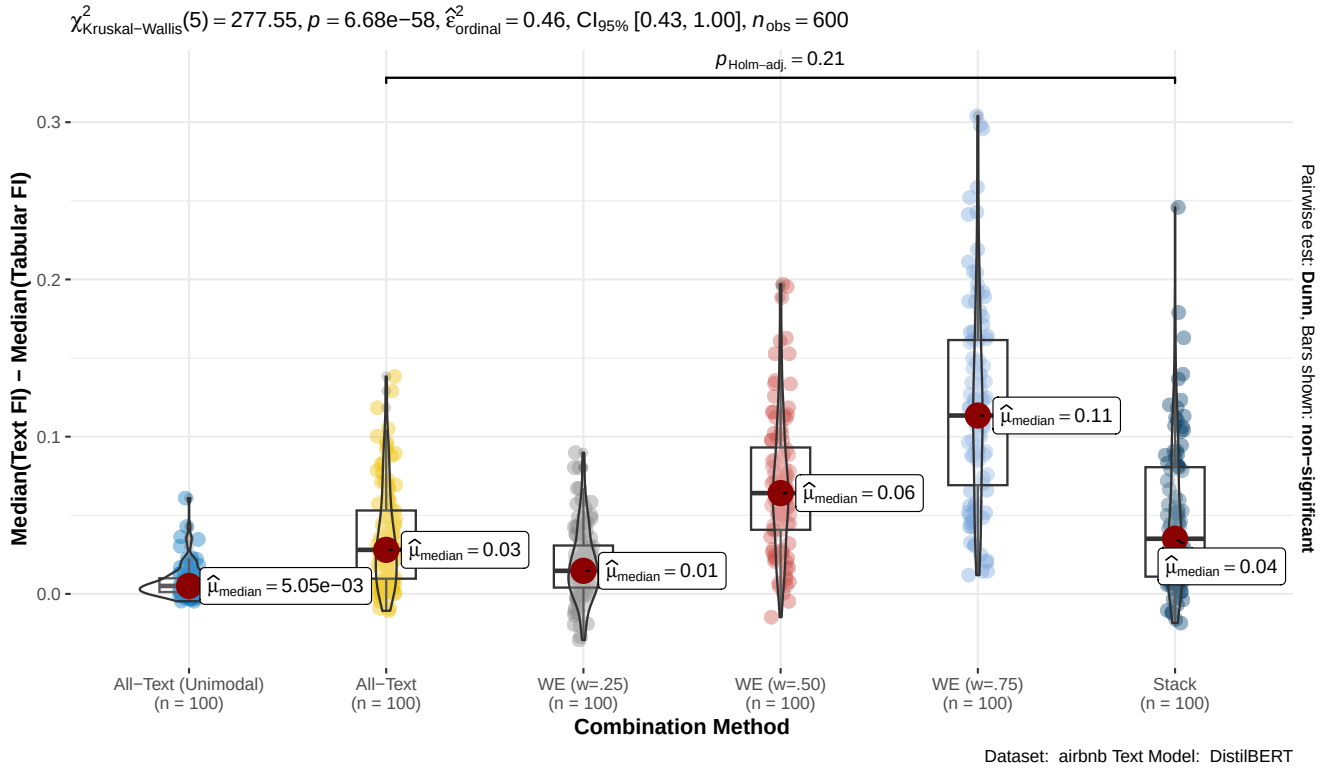


Figure 3. Median Text and Tabular Feature Importances Compared, by Combination Method, on the *airbnb* dataset with DistilBERT text model. WE: *Weighted-Ensemble*.

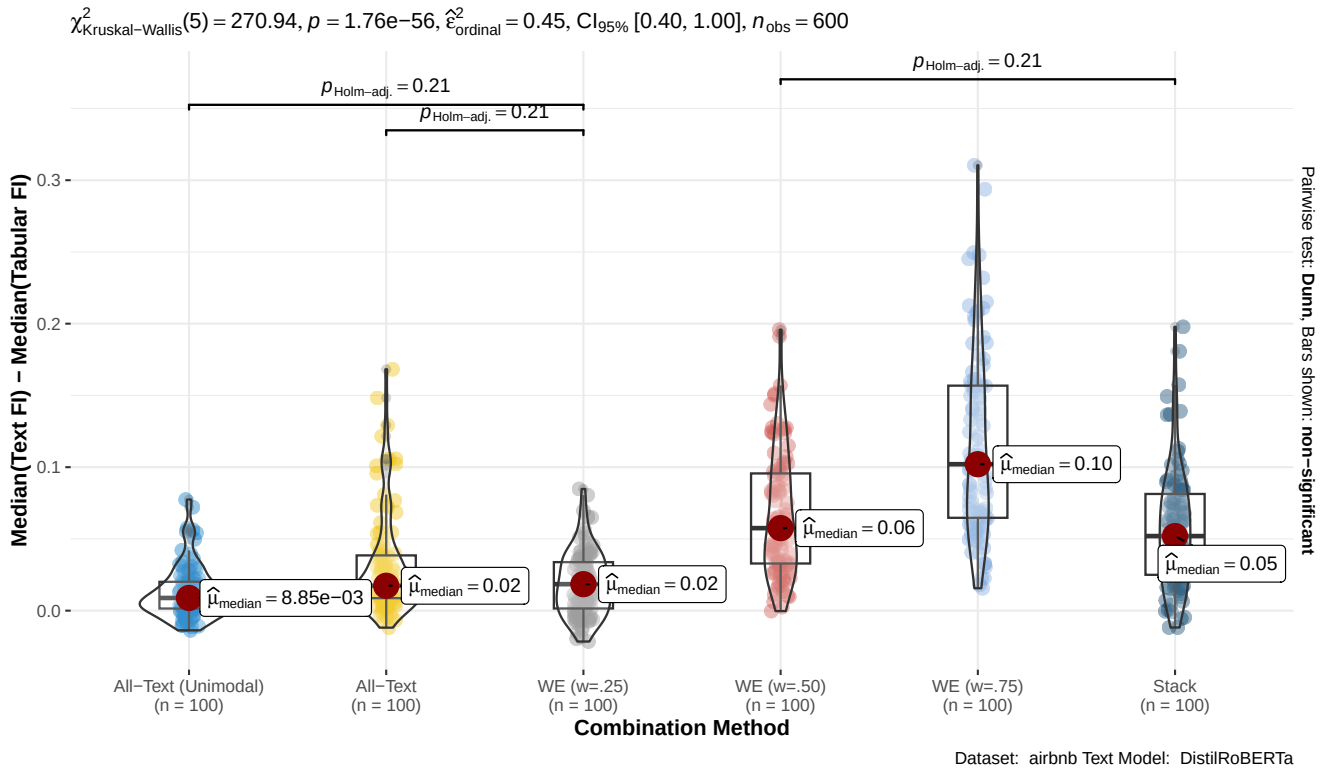


Figure 4. Median Text and Tabular Feature Importances Compared, by Combination Method, on the *airbnb* dataset with DistilRoBERTa text model. WE: *Weighted-Ensemble*.

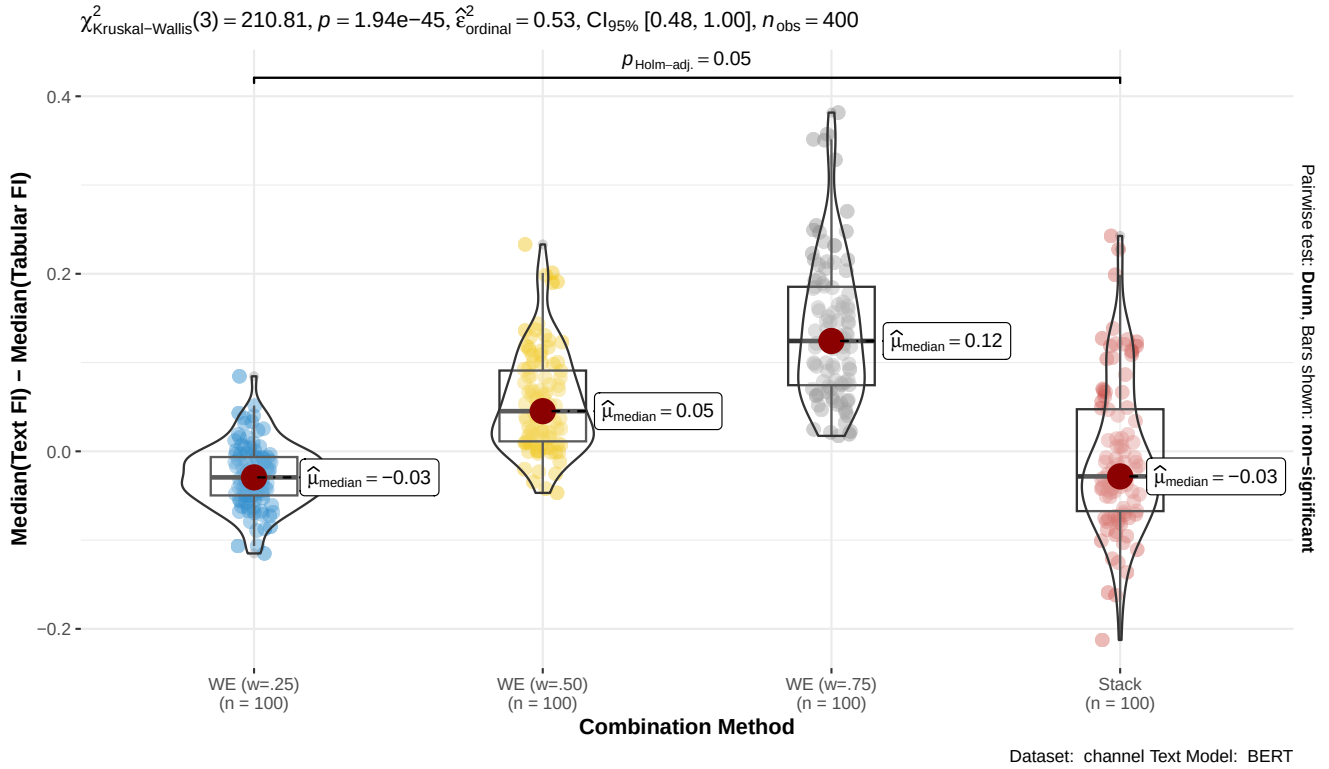


Figure 5. Median Text and Tabular Feature Importances Compared, by Combination Method, on the *channel* dataset with BERT text model. WE: *Weighted-Ensemble*.

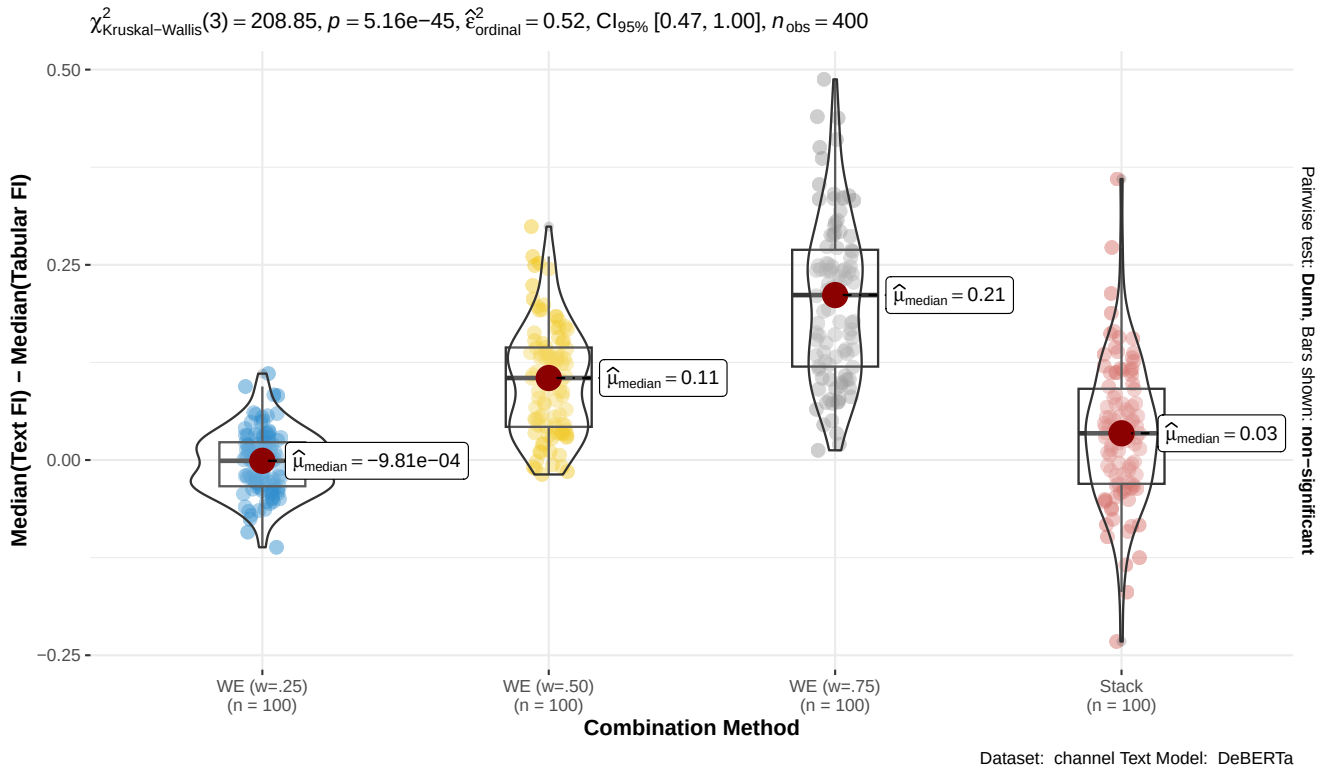


Figure 6. Median Text and Tabular Feature Importances Compared, by Combination Method, on the *channel* dataset with DeBERTa text model. WE: *Weighted-Ensemble*.

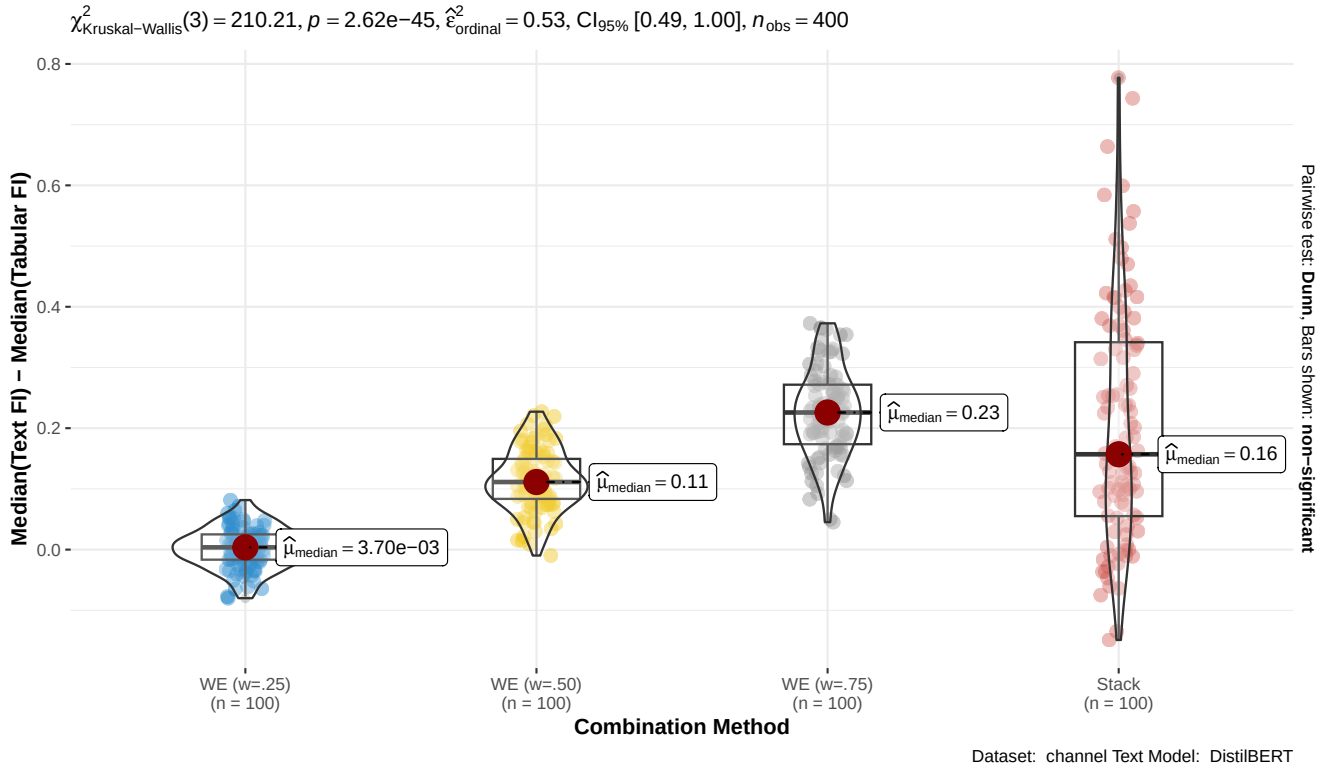


Figure 7. Median Text and Tabular Feature Importances Compared, by Combination Method, on the *channel* dataset with DistilBERT text model. WE: *Weighted-Ensemble*.

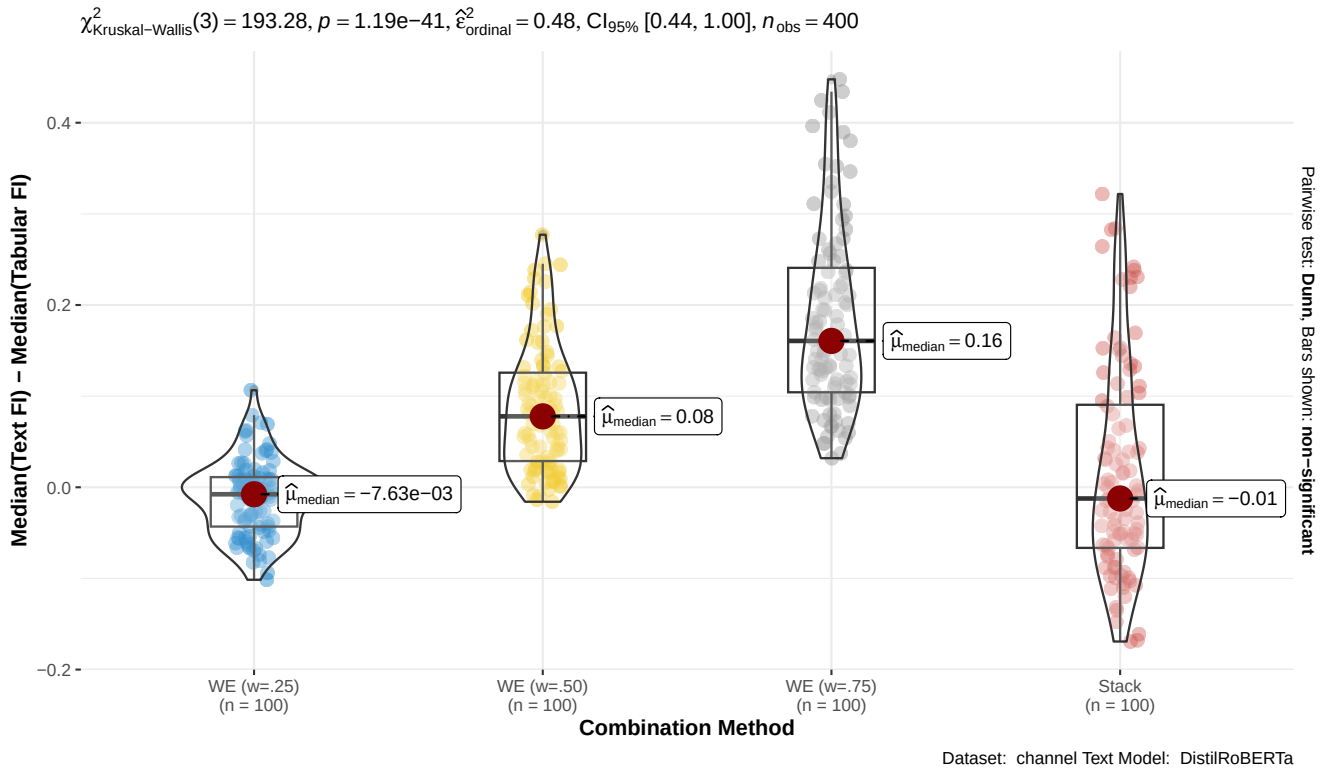


Figure 8. Median Text and Tabular Feature Importances Compared, by Combination Method, on the *channel* dataset with DistilRoBERTa text model. WE: *Weighted-Ensemble*.

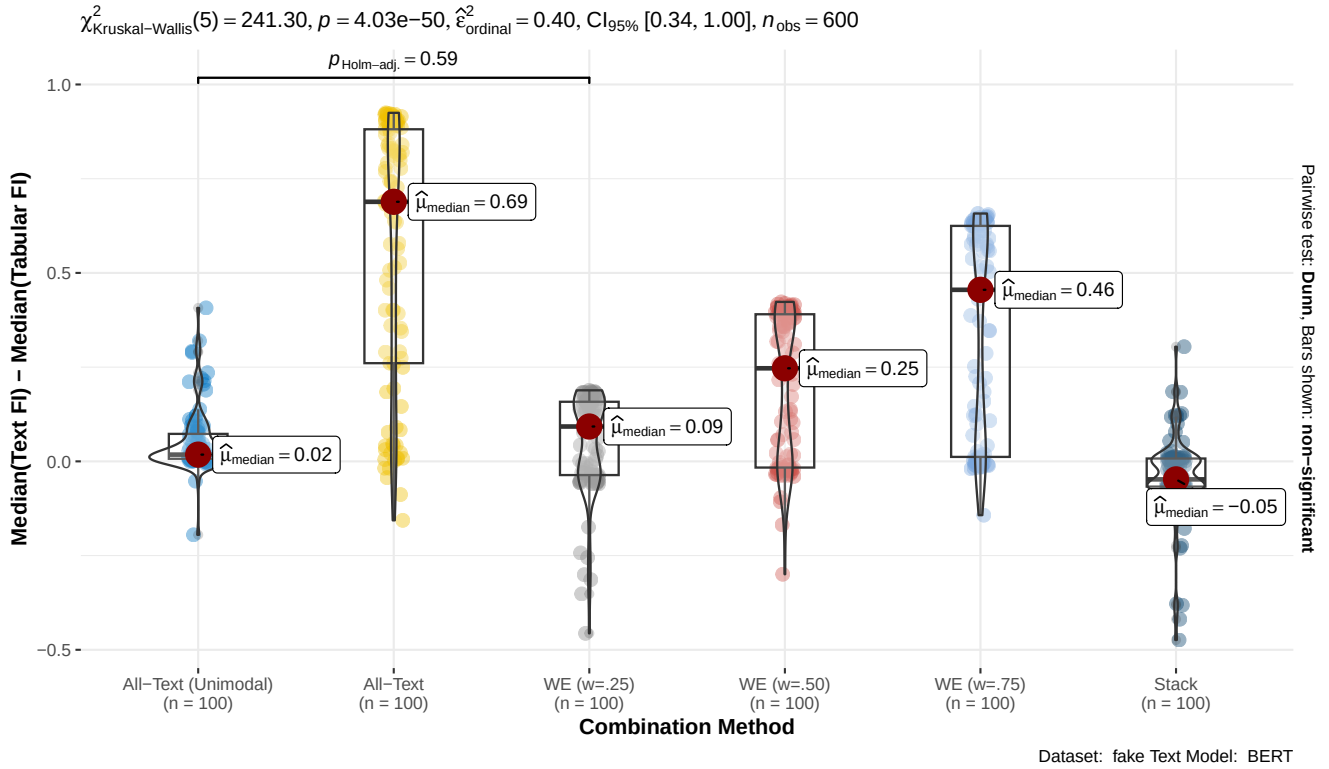


Figure 9. Median Text and Tabular Feature Importances Compared, by Combination Method, on the *fake* dataset with BERT text model. WE: *Weighted-Ensemble*.

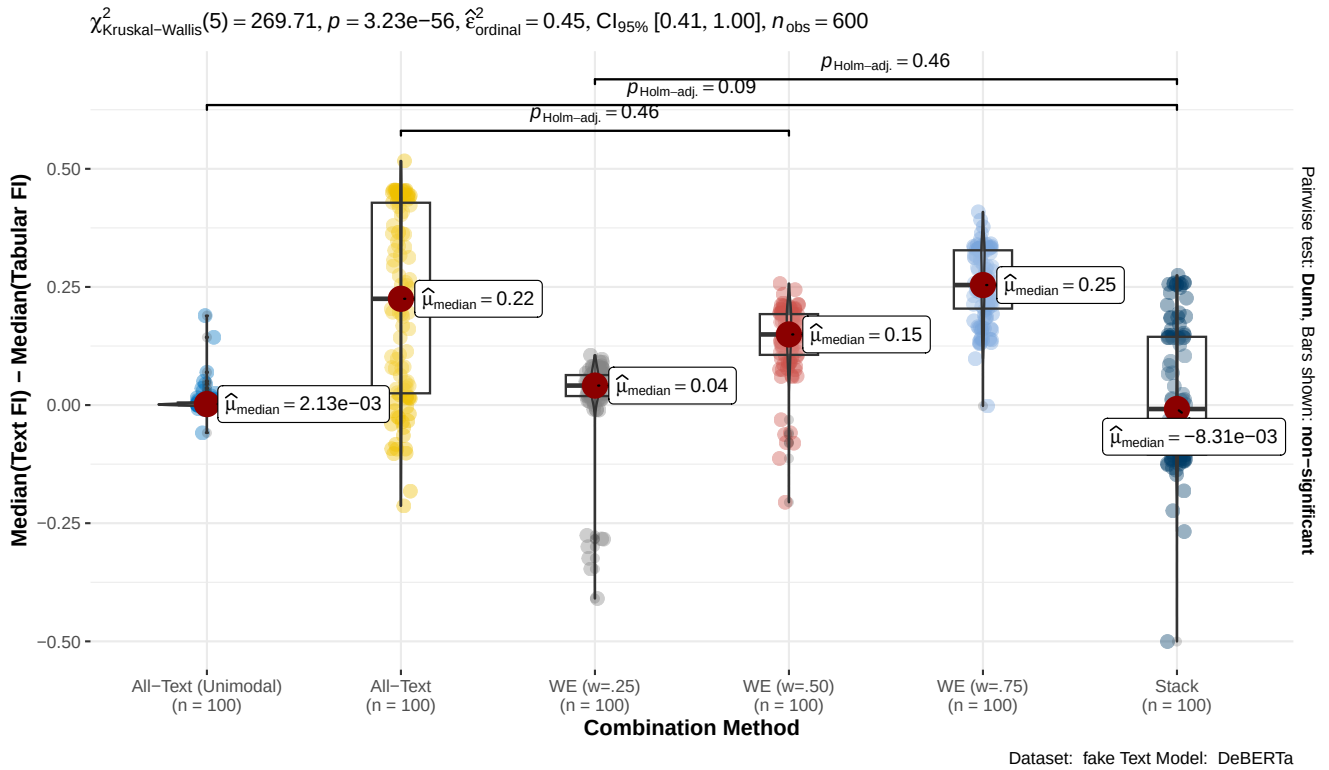


Figure 10. Median Text and Tabular Feature Importances Compared, by Combination Method, on the *fake* dataset with DeBERTa text model. WE: *Weighted-Ensemble*.

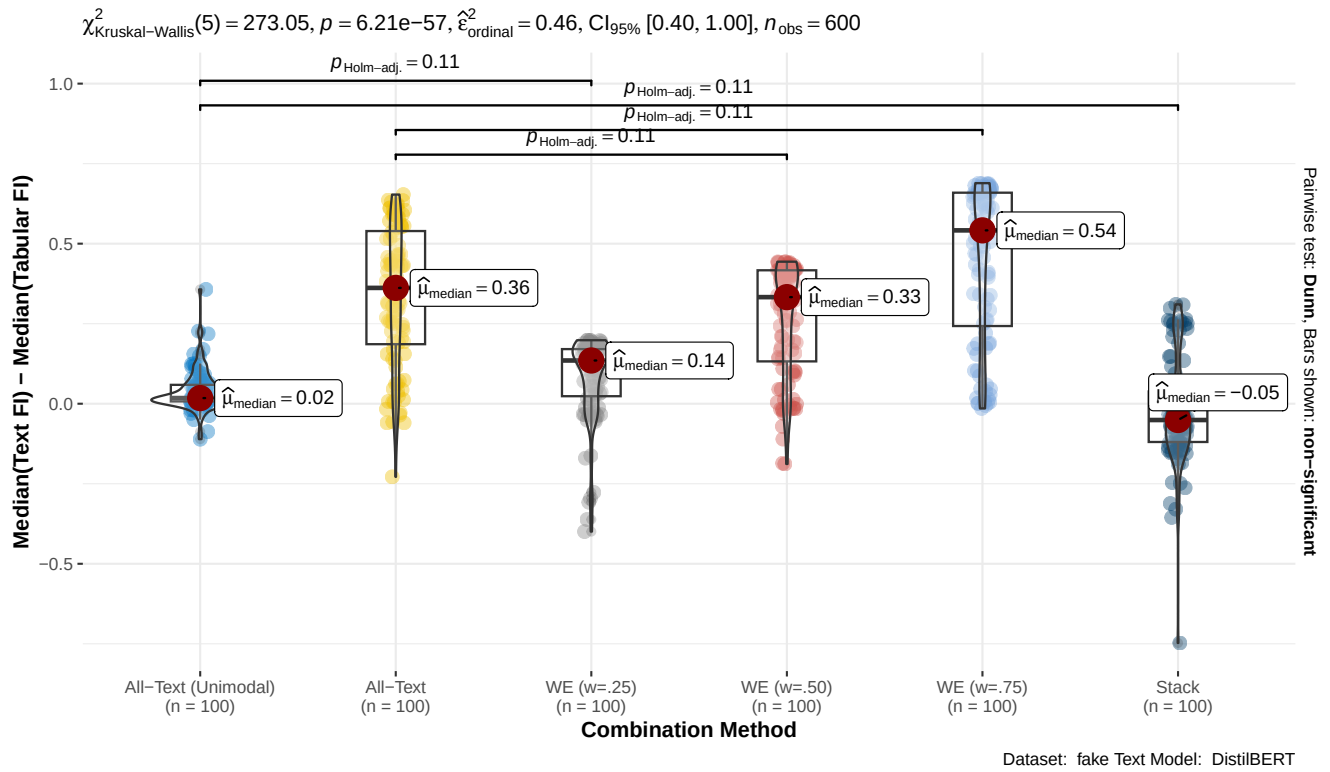


Figure 11. Median Text and Tabular Feature Importances Compared, by Combination Method, on the *fake* dataset with DistilBERT text model. WE: *Weighted-Ensemble*.

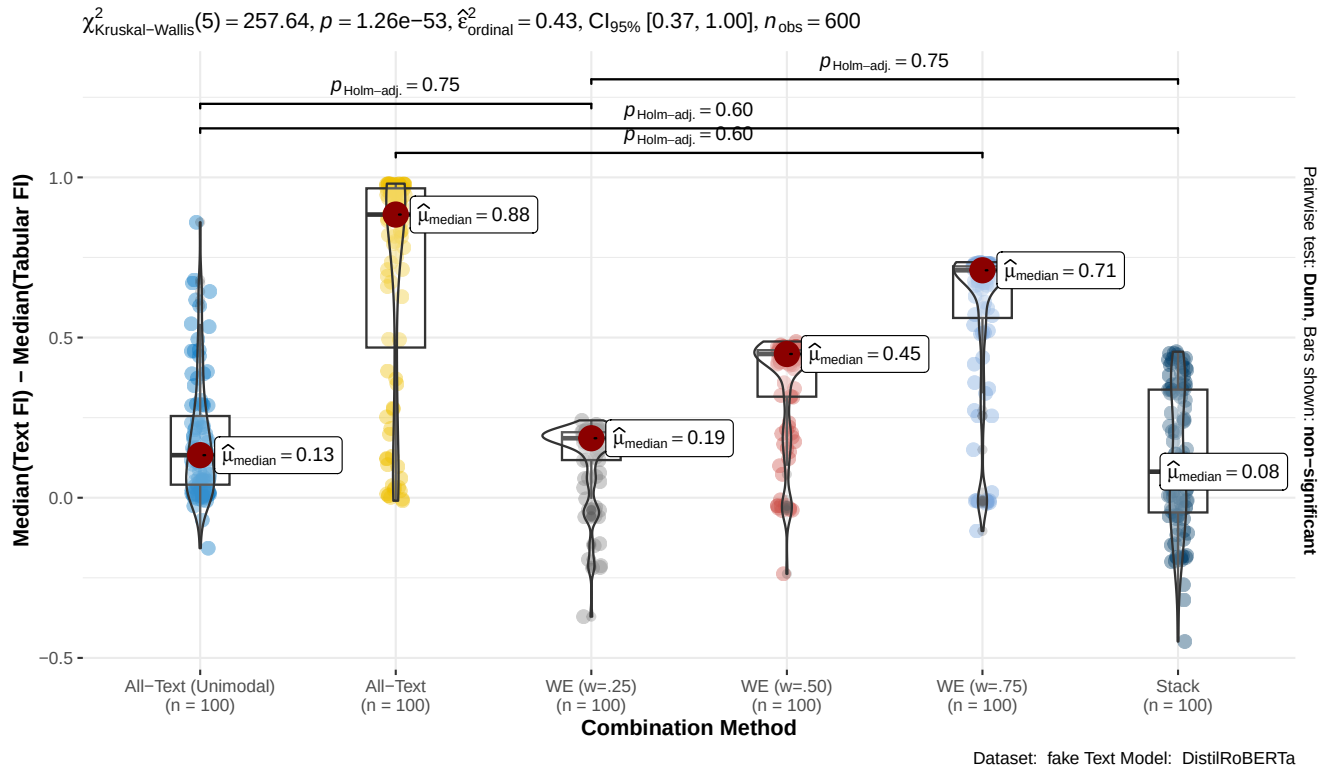


Figure 12. Median Text and Tabular Feature Importances Compared, by Combination Method, on the *fake* dataset with DistilRoBERTa text model. WE: *Weighted-Ensemble*.

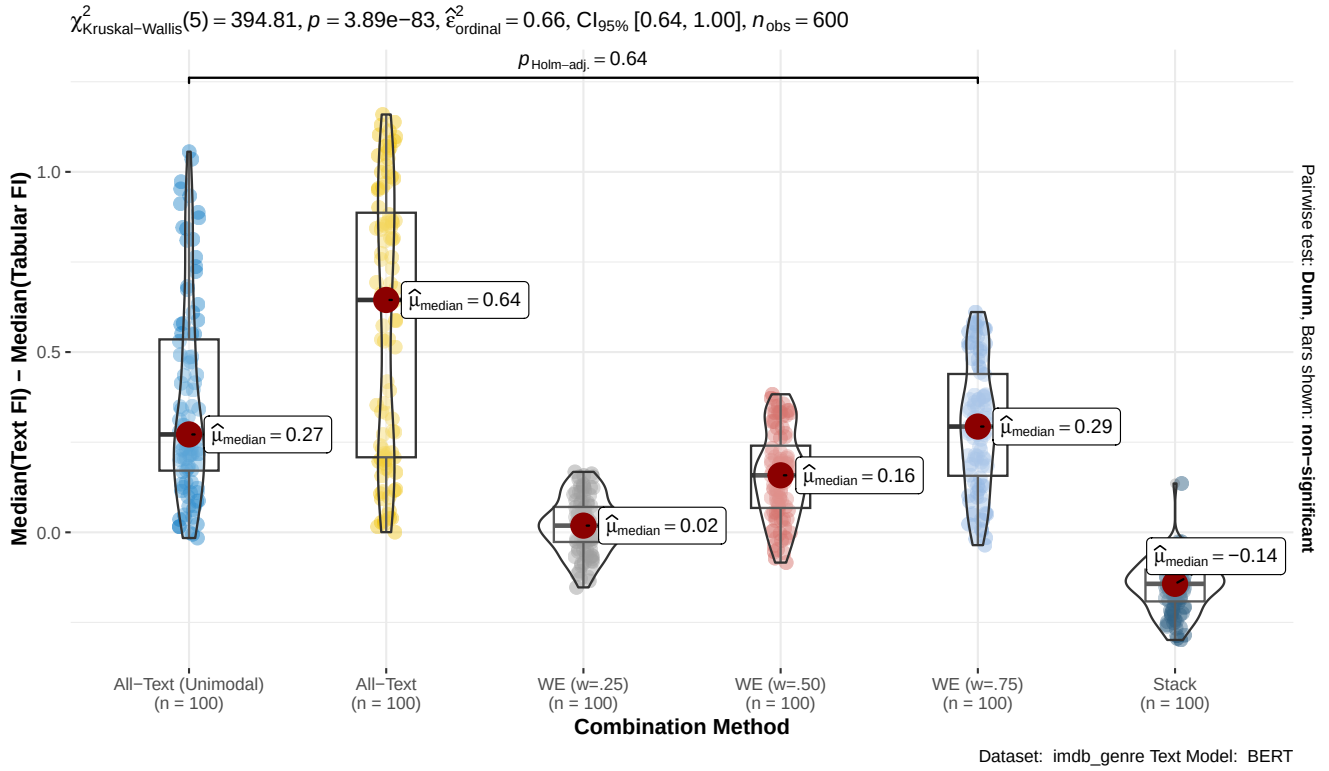


Figure 13. Median Text and Tabular Feature Importances Compared, by Combination Method, on the *imdb* dataset with BERT text model. WE: *Weighted-Ensemble*.

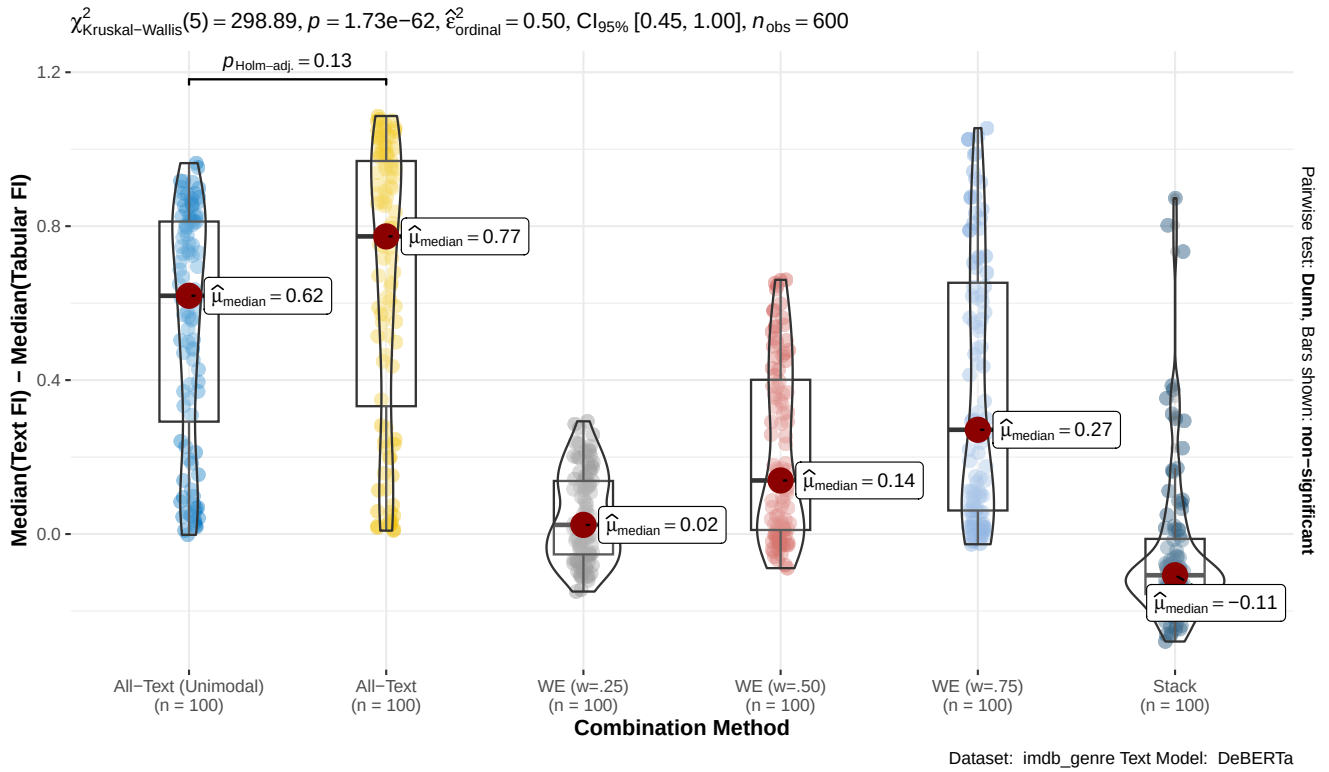


Figure 14. Median Text and Tabular Feature Importances Compared, by Combination Method, on the *imdb* dataset with DeBERTa text model. WE: *Weighted-Ensemble*.

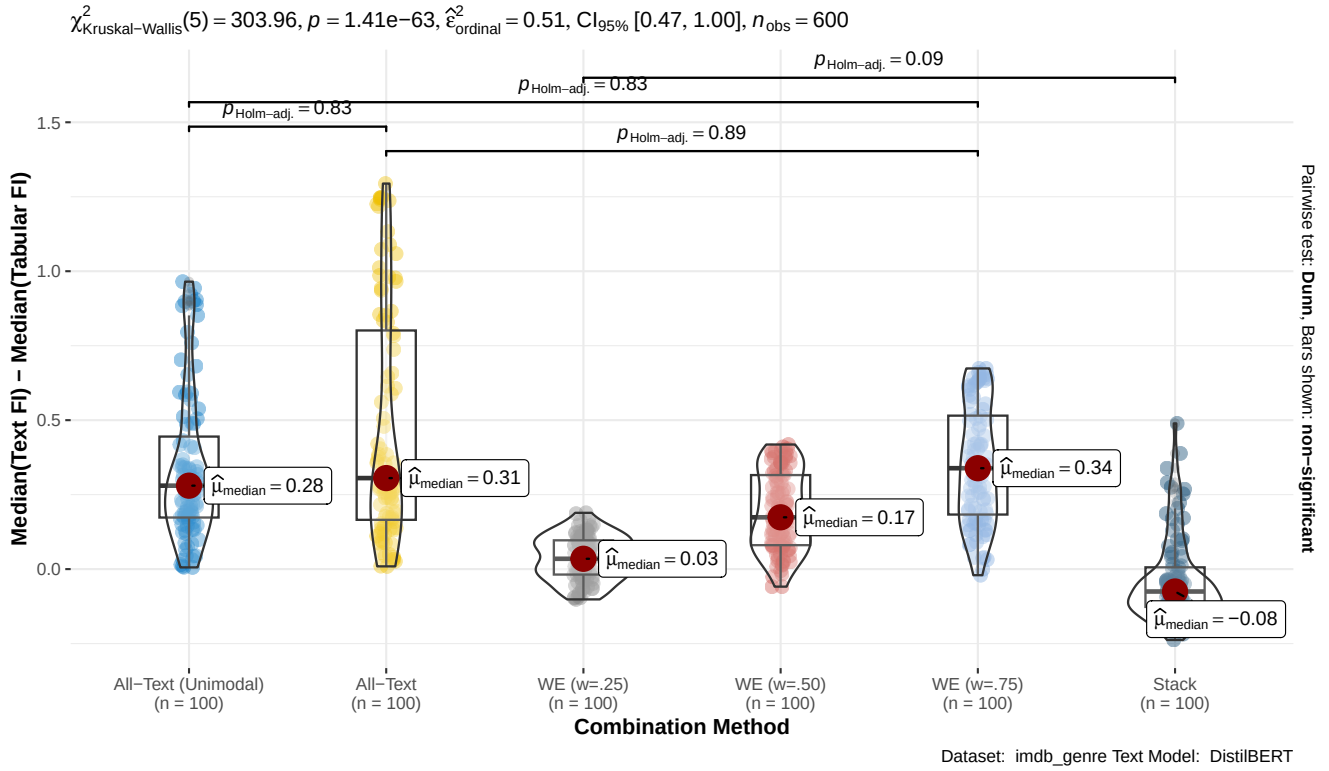


Figure 15. Median Text and Tabular Feature Importances Compared, by Combination Method, on the *imdb* dataset with DistilBERT text model. WE: *Weighted-Ensemble*.

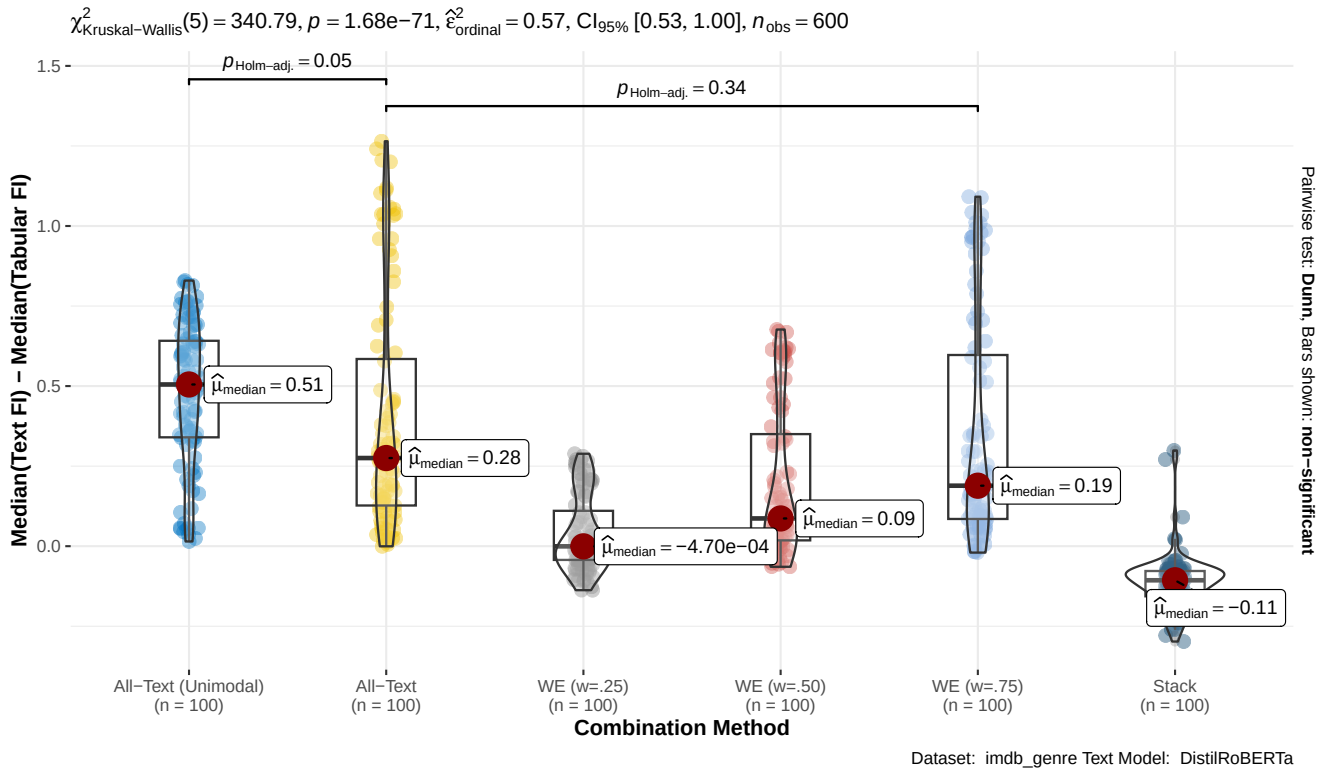


Figure 16. Median Text and Tabular Feature Importances Compared, by Combination Method, on the *imdb* dataset with DistilRoBERTa text model. WE: *Weighted-Ensemble*.

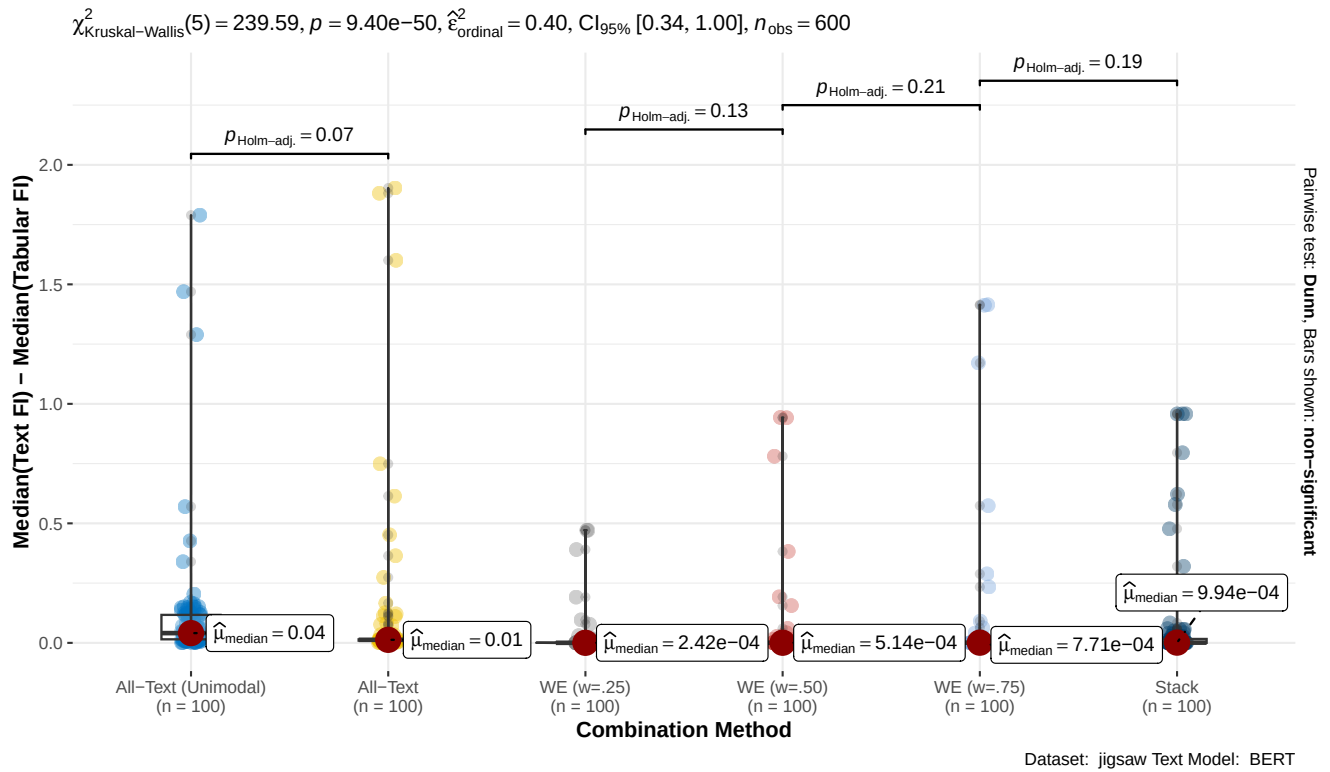


Figure 17. Median Text and Tabular Feature Importances Compared, by Combination Method, on the *jigsaw* dataset with BERT text model. WE: *Weighted-Ensemble*.

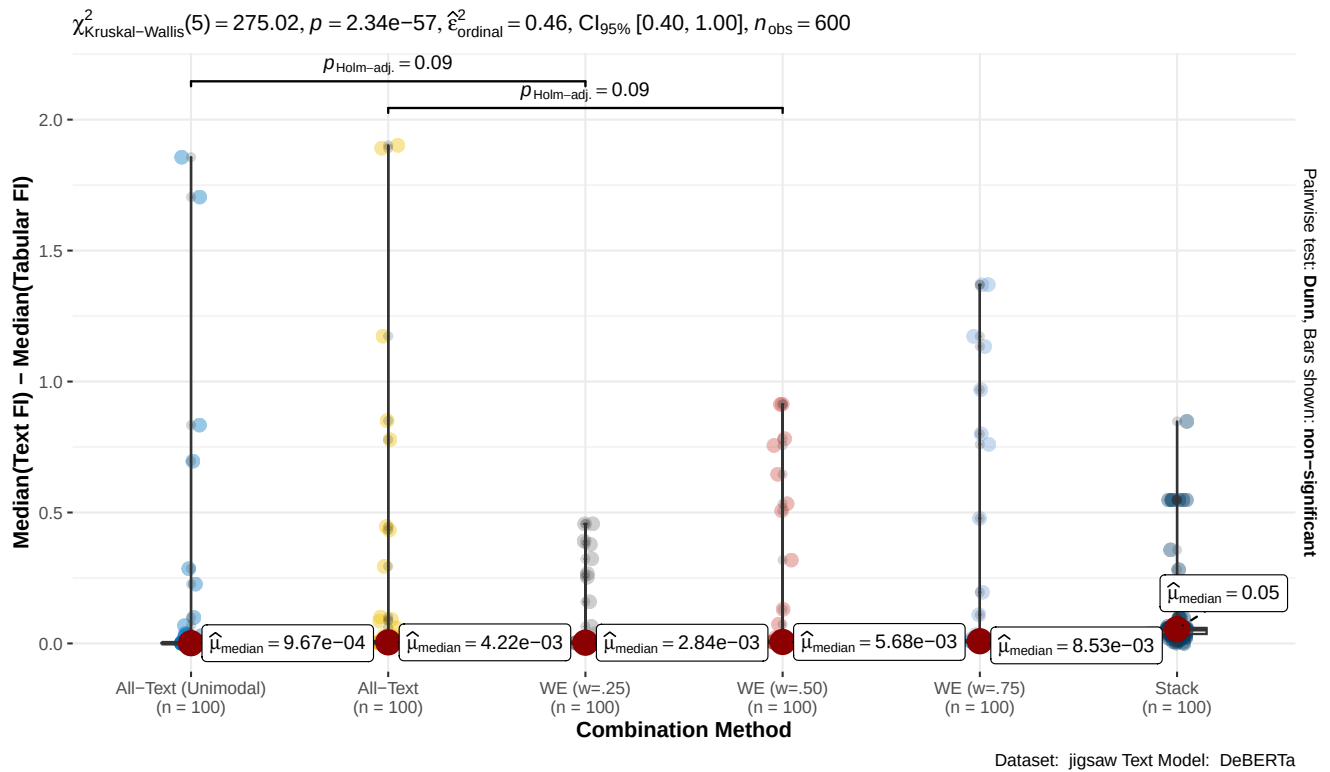


Figure 18. Median Text and Tabular Feature Importances Compared, by Combination Method, on the *jigsaw* dataset with DeBERTa text model. WE: *Weighted-Ensemble*.

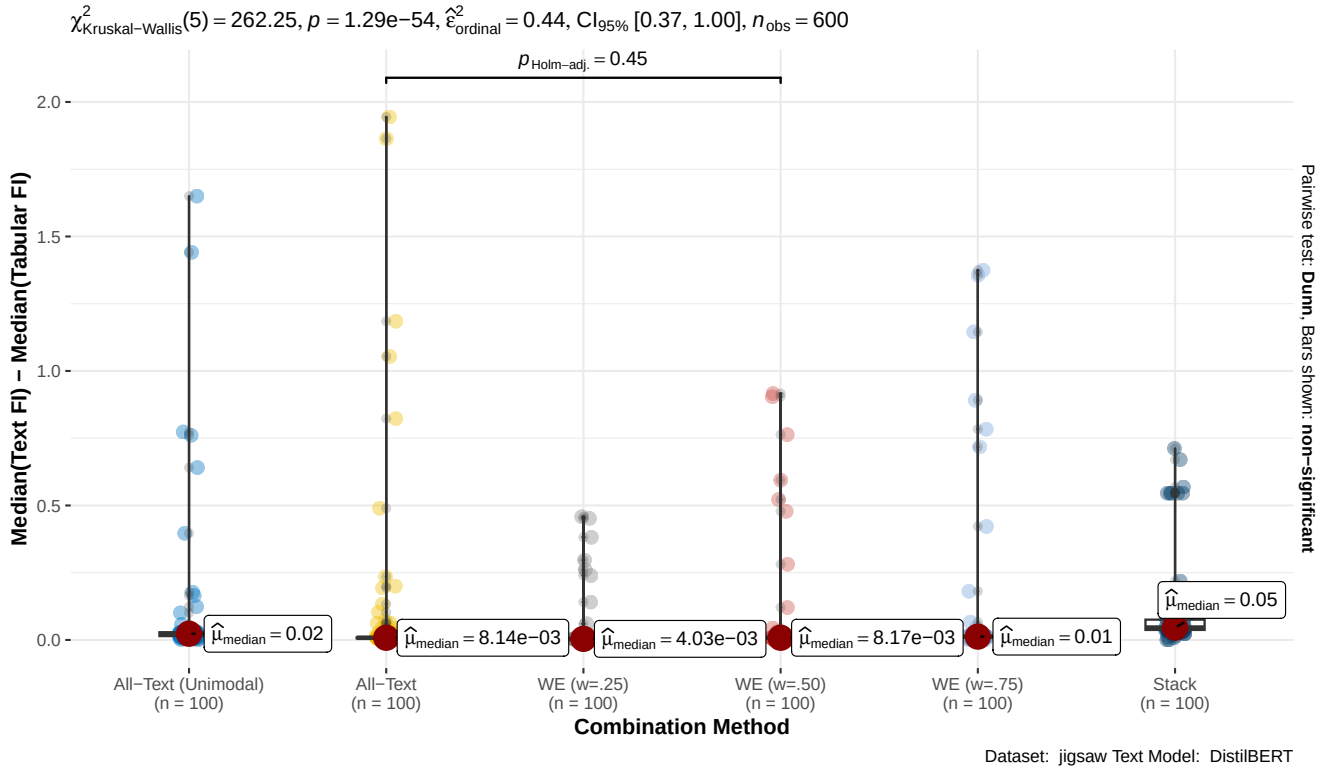


Figure 19. Median Text and Tabular Feature Importances Compared, by Combination Method, on the *jigsaw* dataset with DistilBERT text model. WE: *Weighted-Ensemble*.

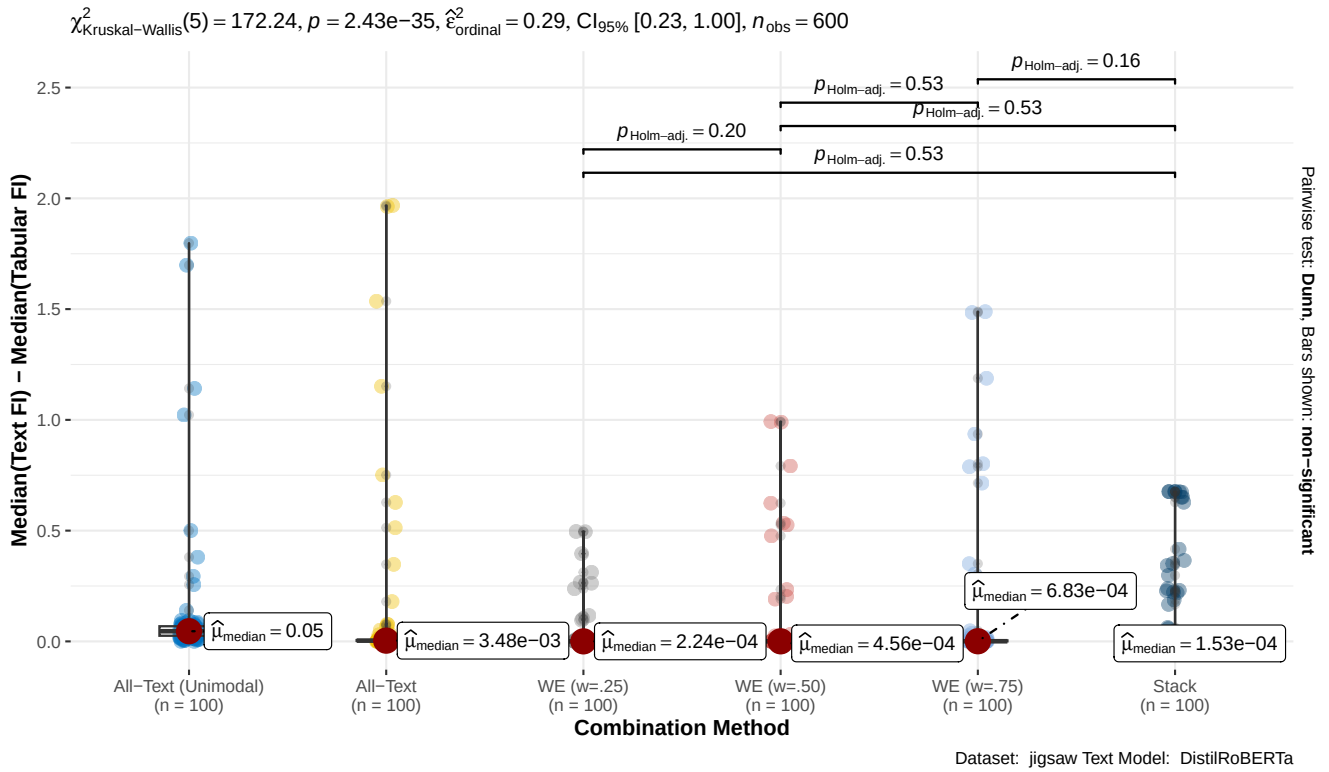


Figure 20. Median Text and Tabular Feature Importances Compared, by Combination Method, on the *jigsaw* dataset with DistilRoBERTa text model. WE: *Weighted-Ensemble*.

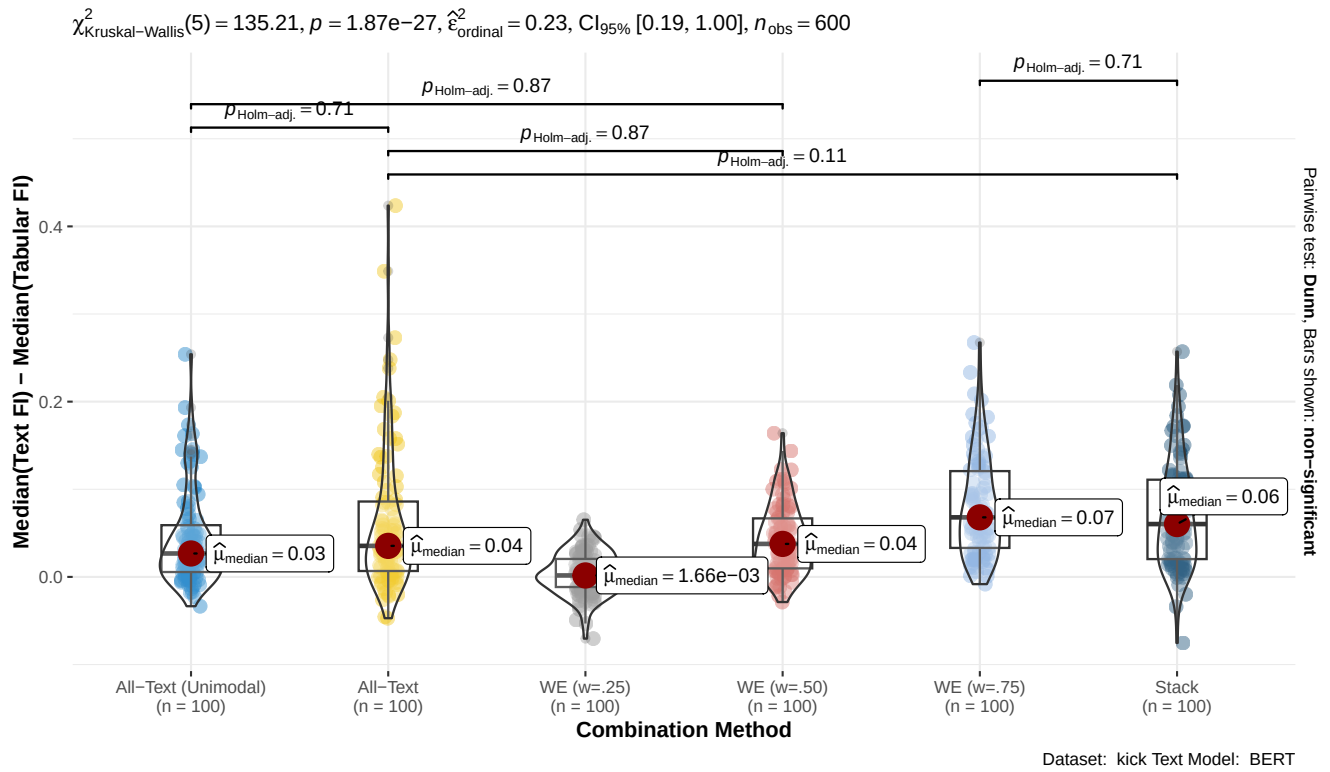


Figure 21. Median Text and Tabular Feature Importances Compared, by Combination Method, on the *kick* dataset with BERT text model. WE: *Weighted-Ensemble*.

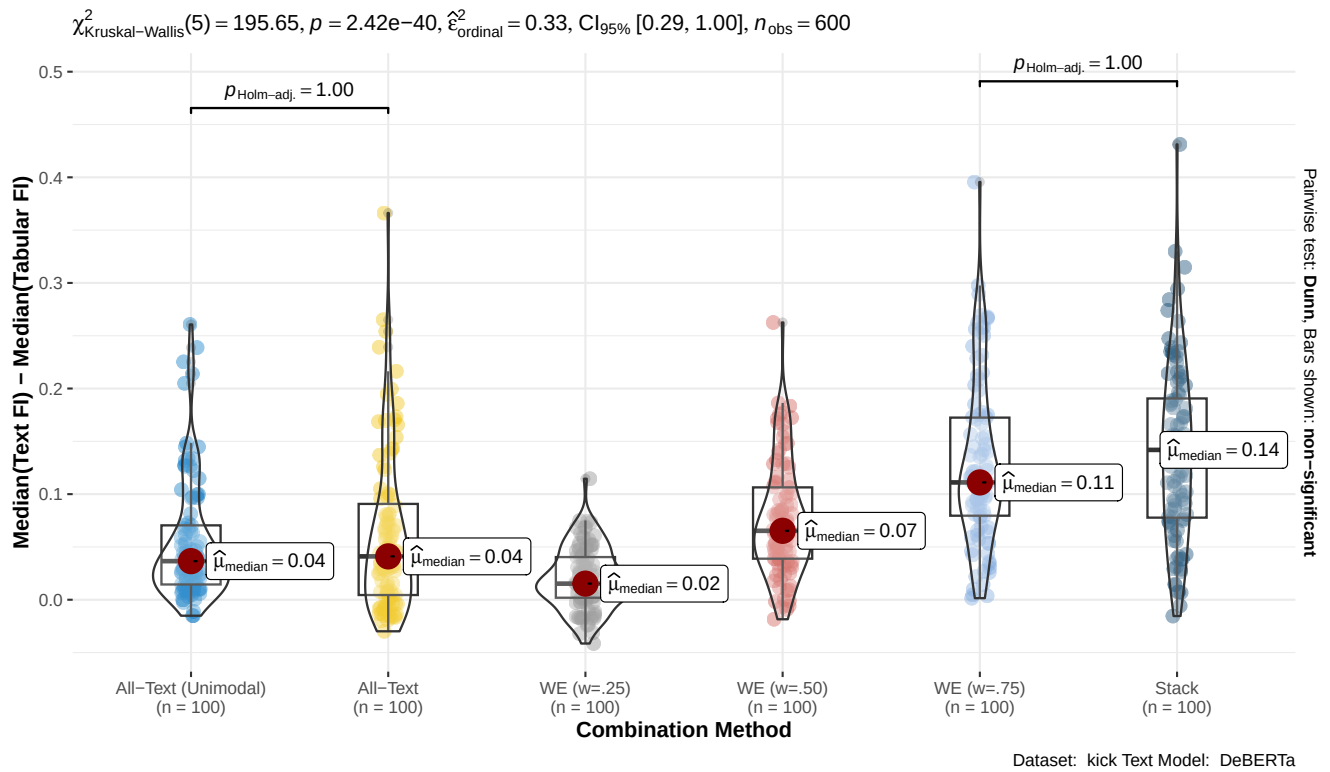


Figure 22. Median Text and Tabular Feature Importances Compared, by Combination Method, on the *kick* dataset with DeBERTa text model. WE: *Weighted-Ensemble*.

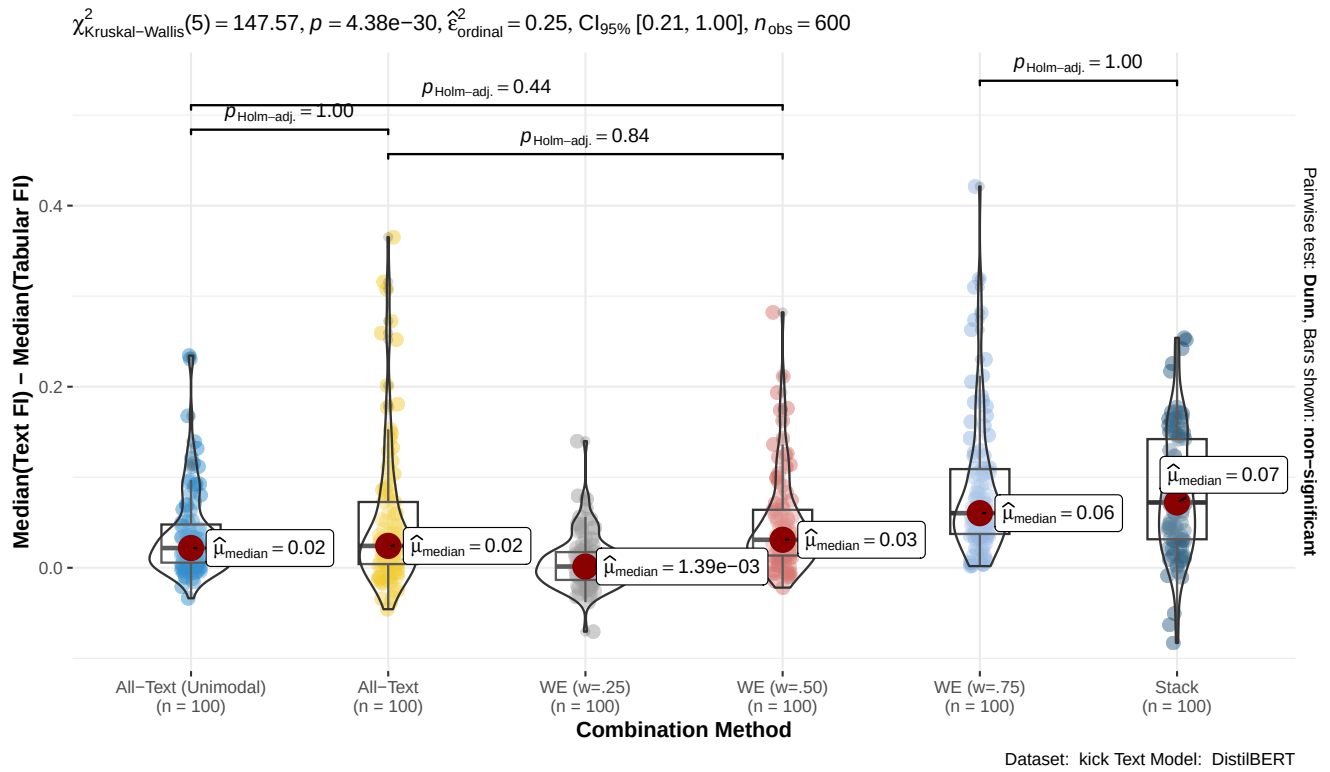


Figure 23. Median Text and Tabular Feature Importances Compared, by Combination Method, on the *kick* dataset with DistilBERT text model. WE: *Weighted-Ensemble*.

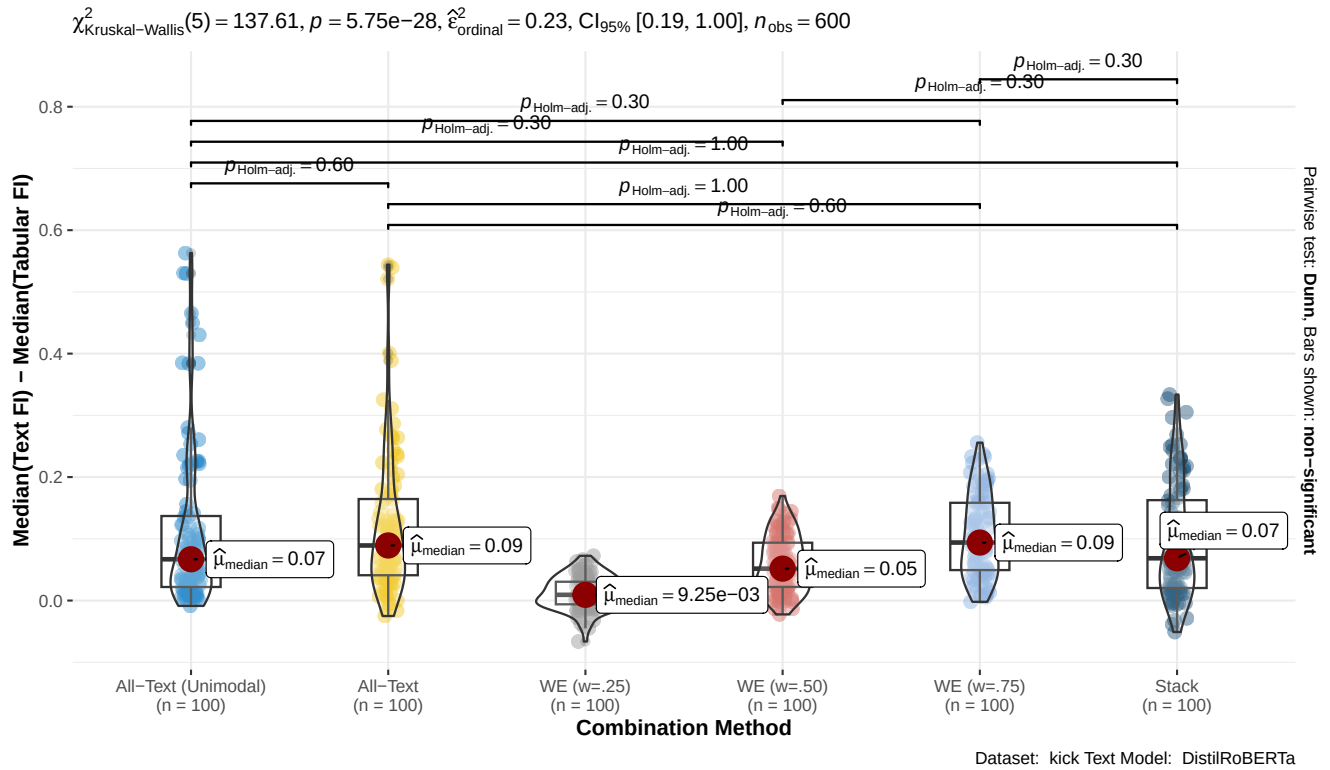


Figure 24. Median Text and Tabular Feature Importances Compared, by Combination Method, on the *kick* dataset with DistilRoBERTa text model. WE: *Weighted-Ensemble*.

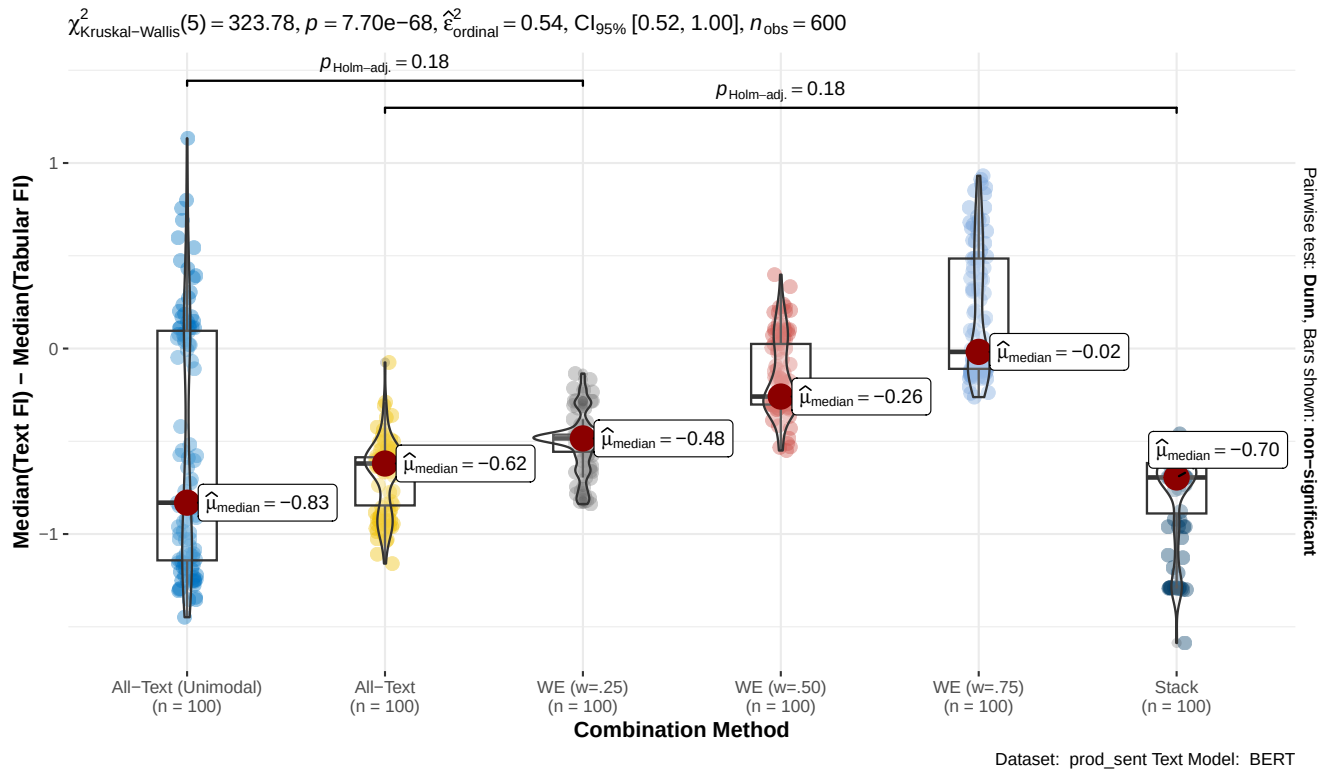


Figure 25. Median Text and Tabular Feature Importances Compared, by Combination Method, on the *prod* dataset with BERT text model. WE: *Weighted-Ensemble*.

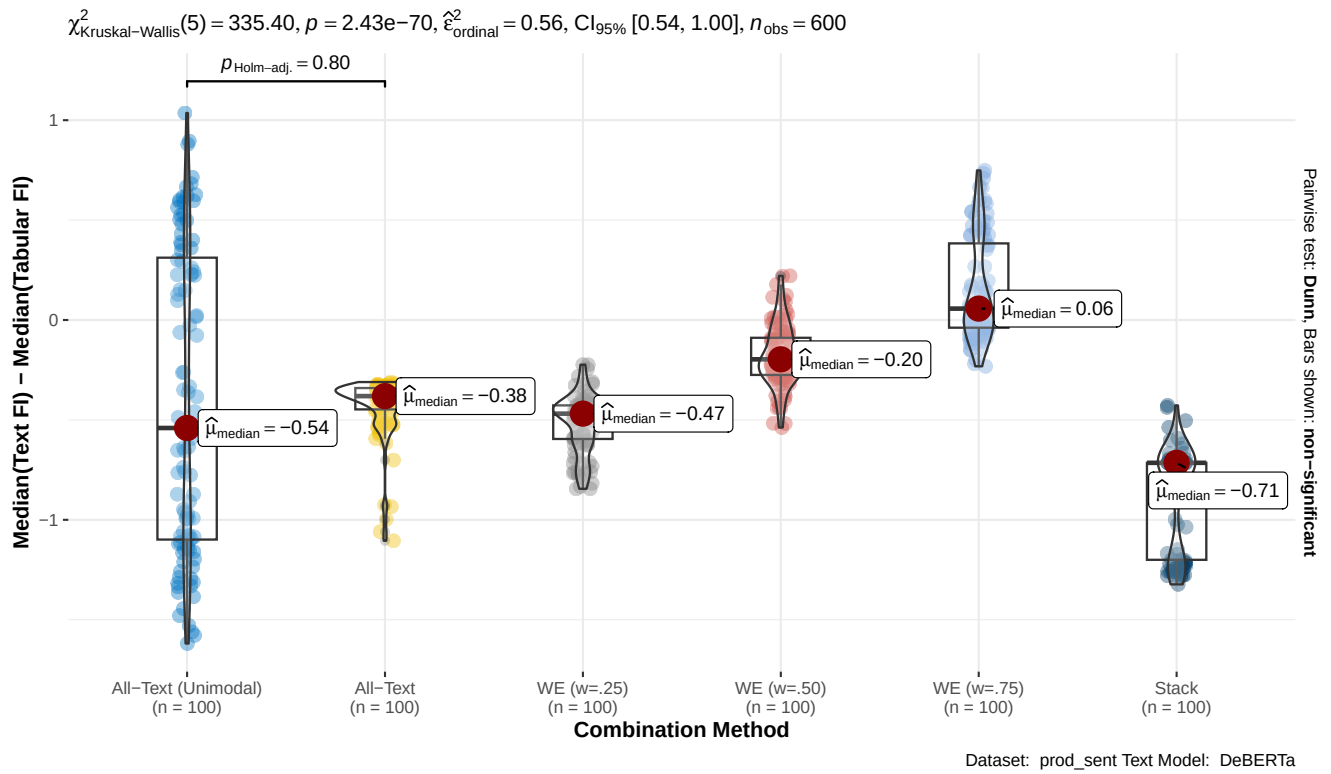


Figure 26. Median Text and Tabular Feature Importances Compared, by Combination Method, on the *prod* dataset with DeBERTa text model. WE: *Weighted-Ensemble*.

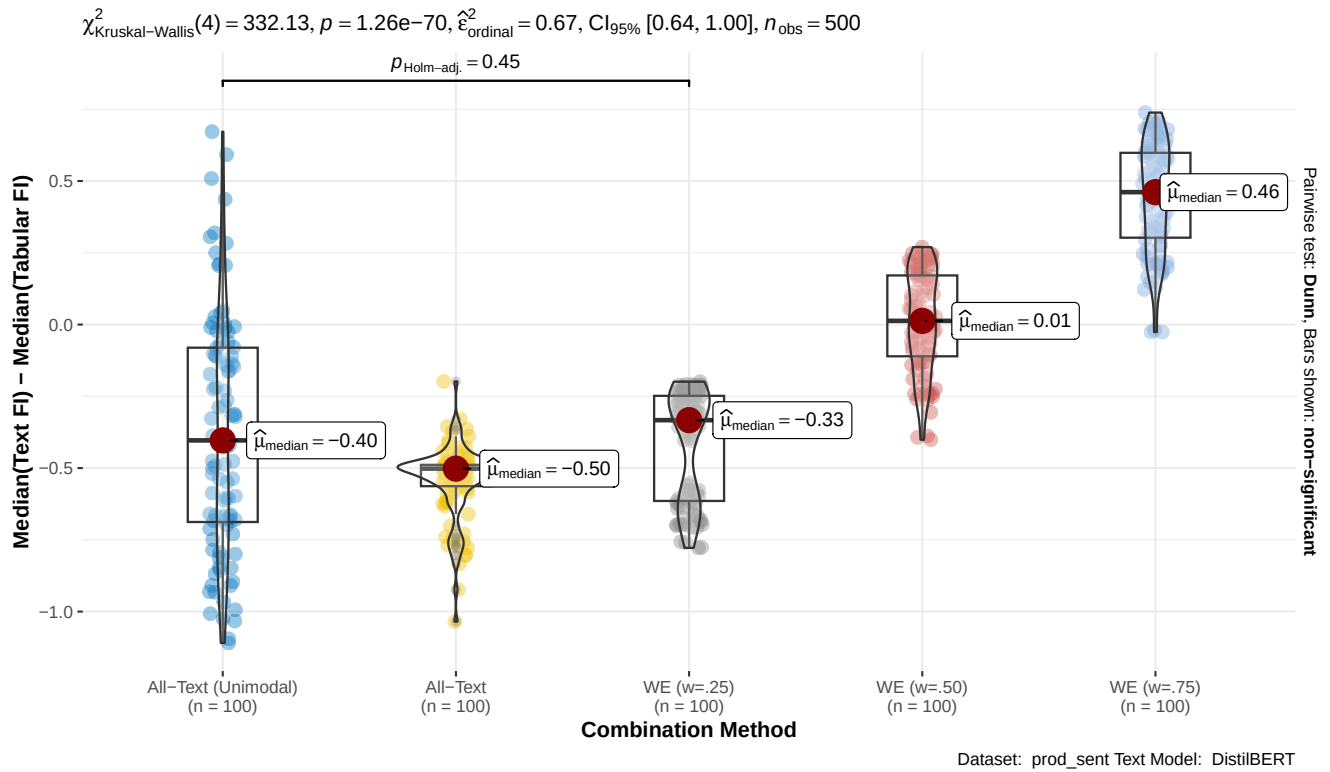


Figure 27. Median Text and Tabular Feature Importances Compared, by Combination Method, on the *prod* dataset with DistilBERT text model. WE: *Weighted-Ensemble*.

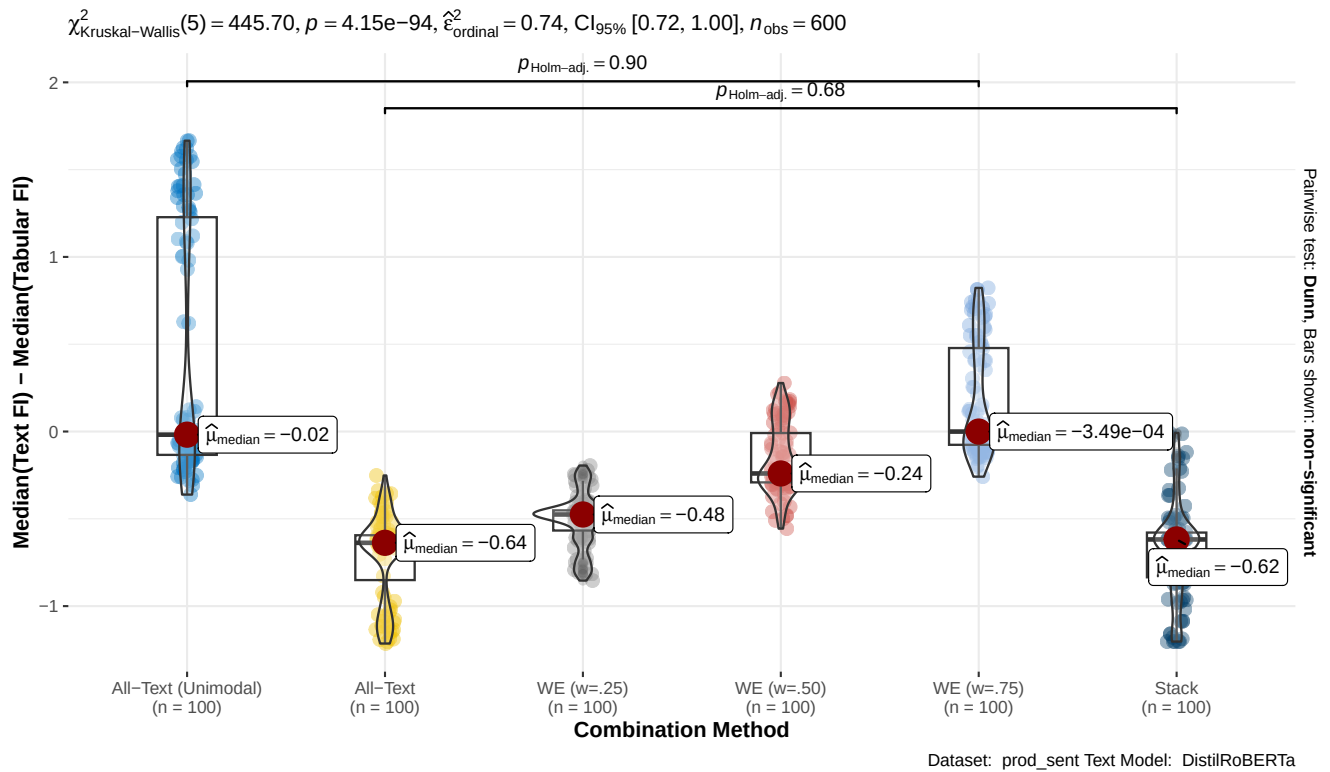


Figure 28. Median Text and Tabular Feature Importances Compared, by Combination Method, on the *prod* dataset with DistilRoBERTa text model. WE: *Weighted-Ensemble*.

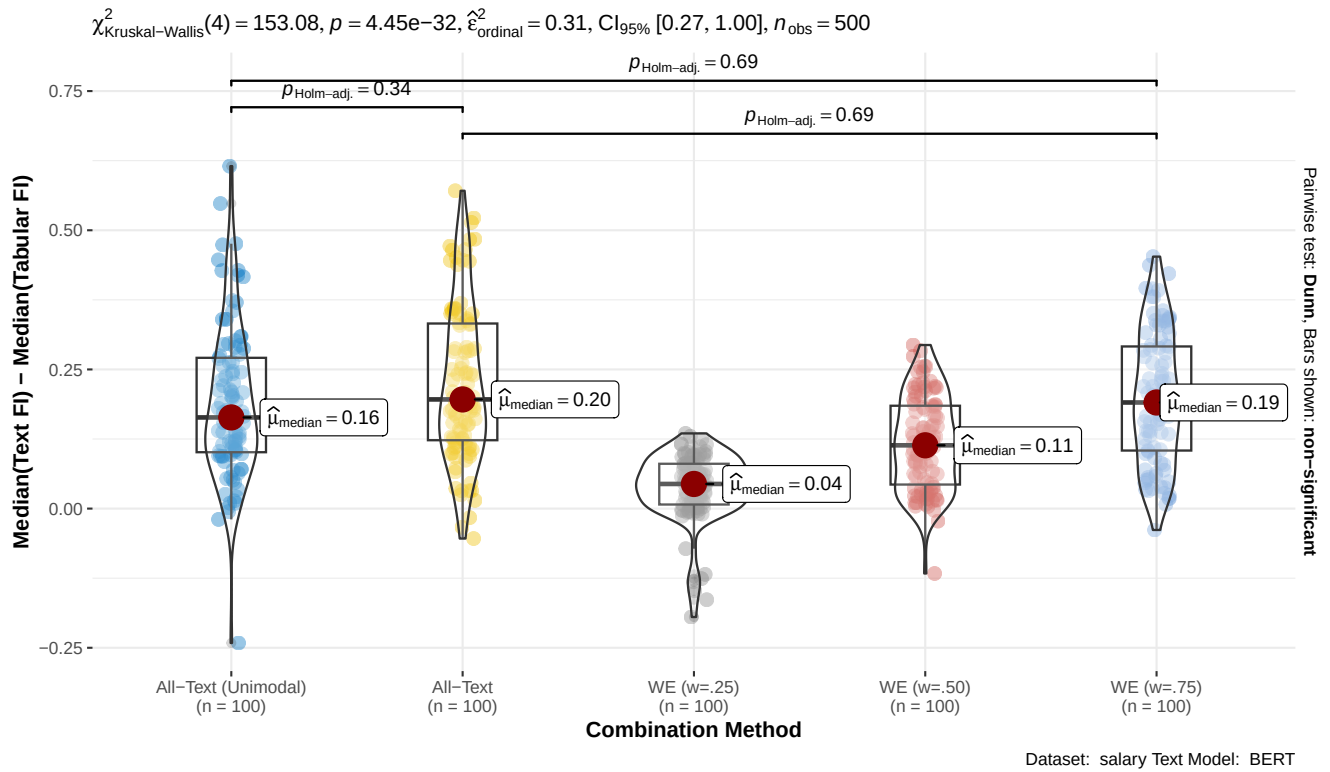


Figure 29. Median Text and Tabular Feature Importances Compared, by Combination Method, on the *salary* dataset with BERT text model. WE: *Weighted-Ensemble*.

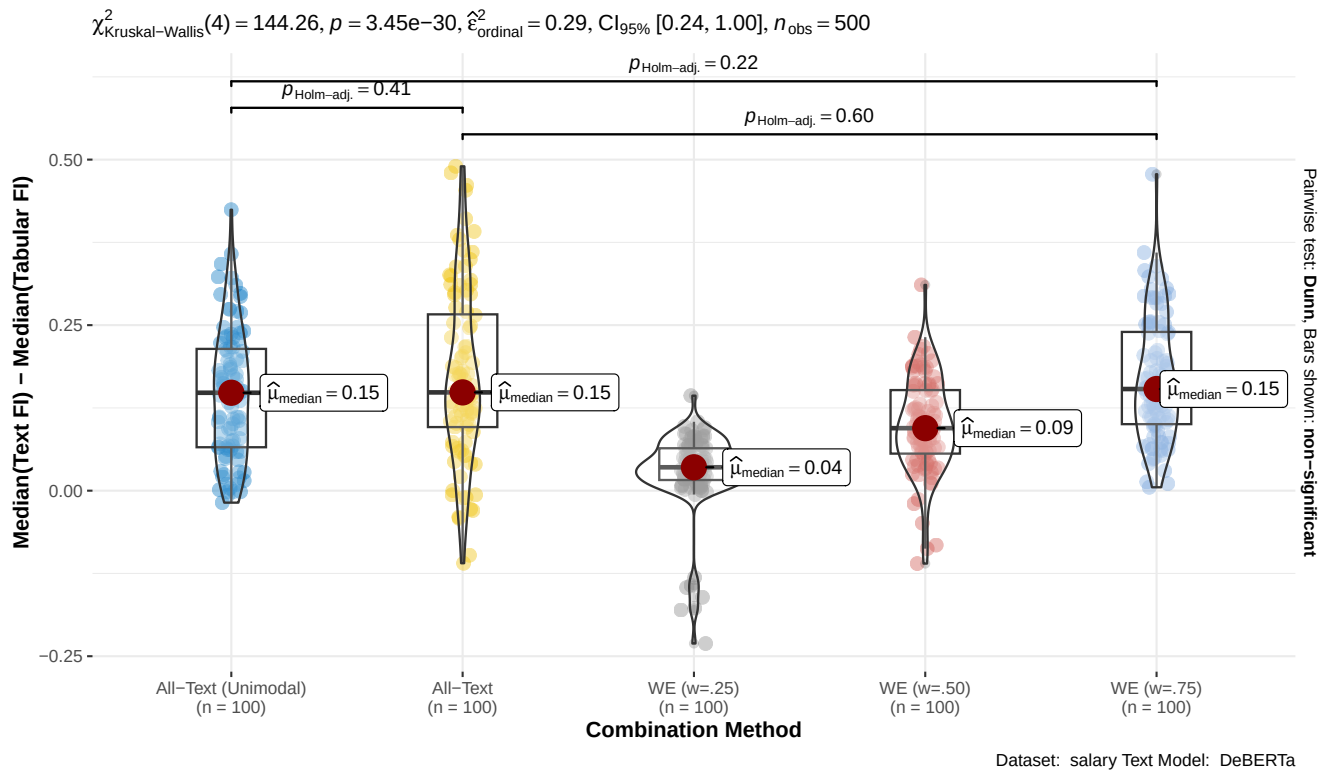


Figure 30. Median Text and Tabular Feature Importances Compared, by Combination Method, on the *salary* dataset with DeBERTa text model. WE: *Weighted-Ensemble*.

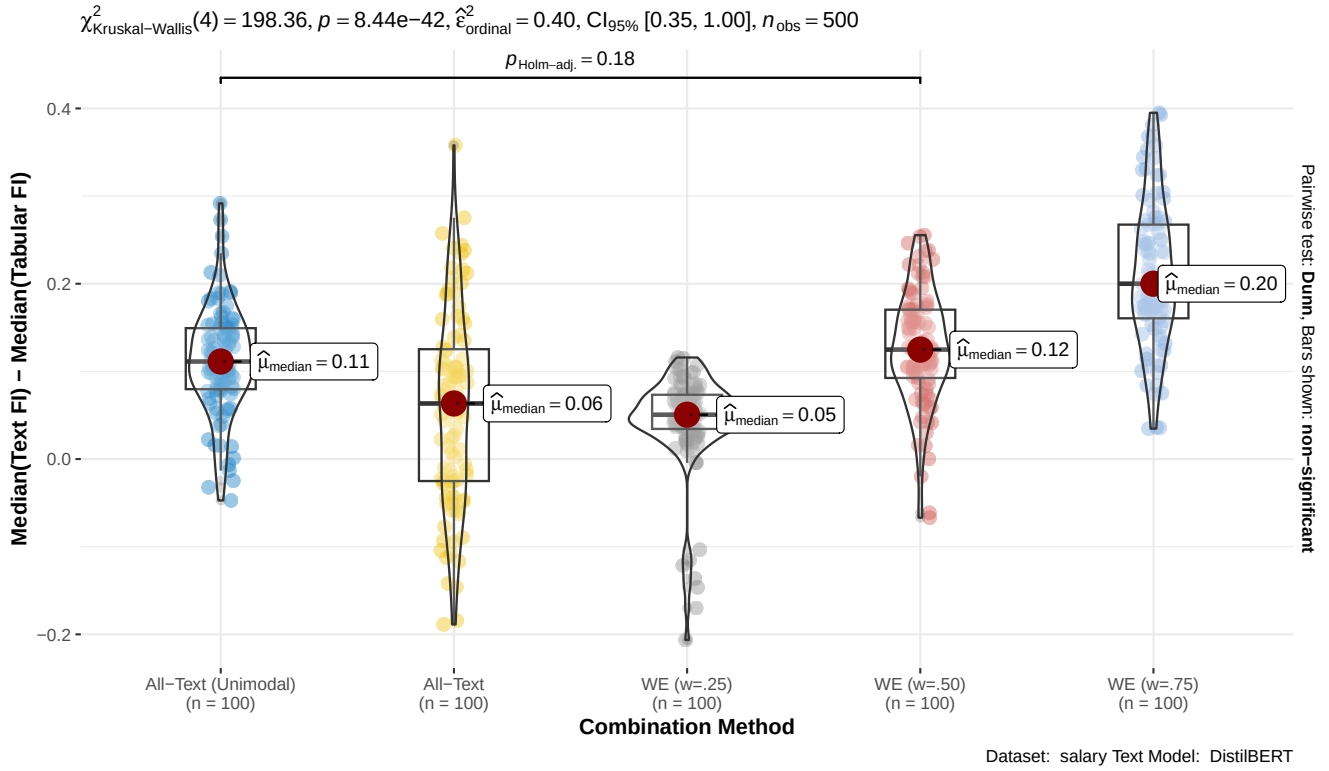


Figure 31. Median Text and Tabular Feature Importances Compared, by Combination Method, on the *salary* dataset with DistilBERT text model. WE: *Weighted-Ensemble*.

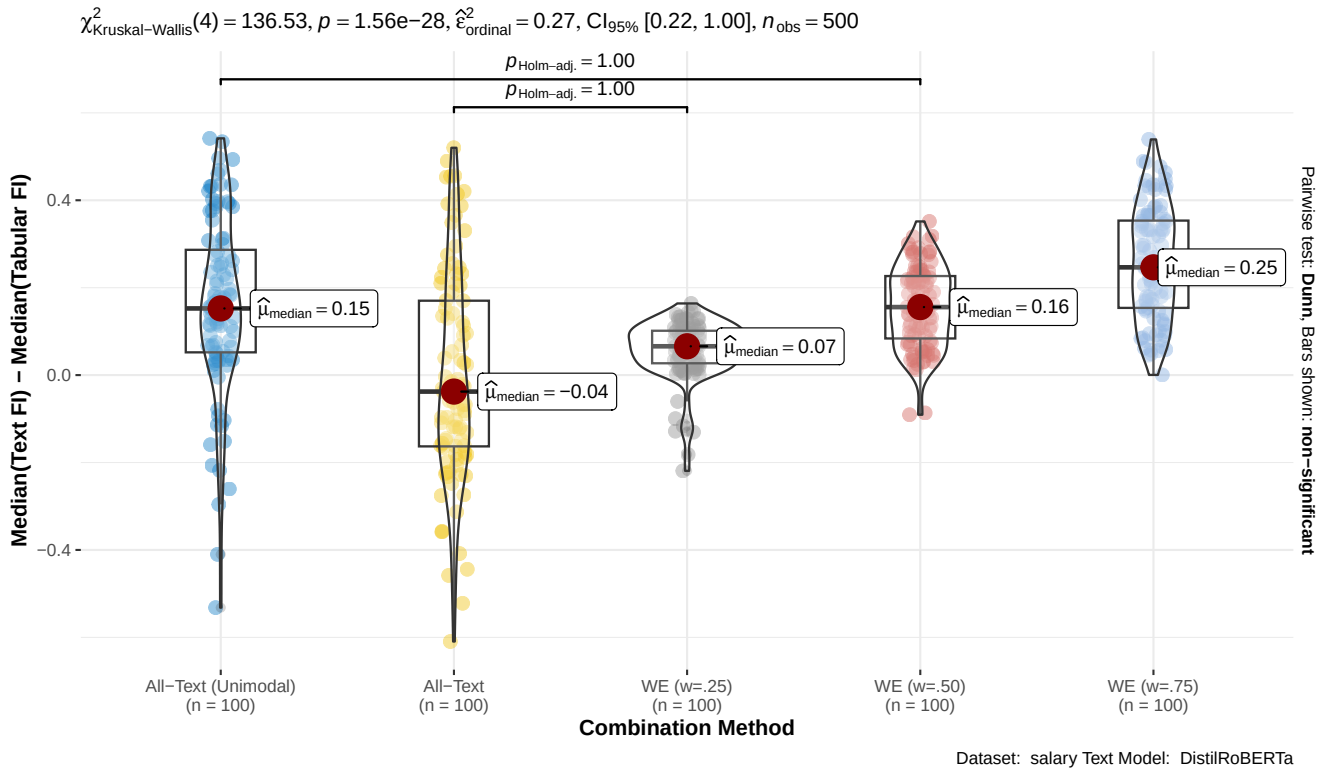


Figure 32. Median Text and Tabular Feature Importances Compared, by Combination Method, on the *salary* dataset with DistilRoBERTa text model. WE: *Weighted-Ensemble*.

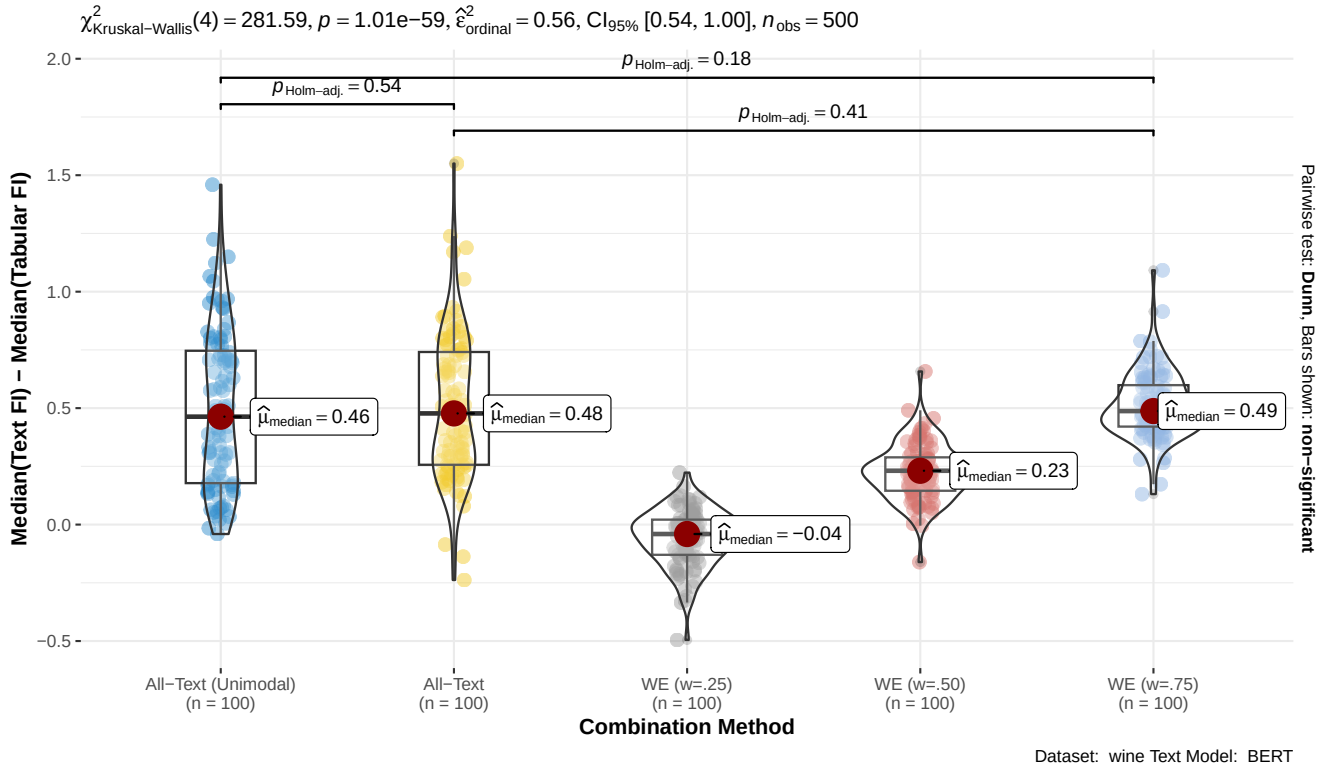


Figure 33. Median Text and Tabular Feature Importances Compared, by Combination Method, on the *wine* dataset with BERT text model. WE: *Weighted-Ensemble*.

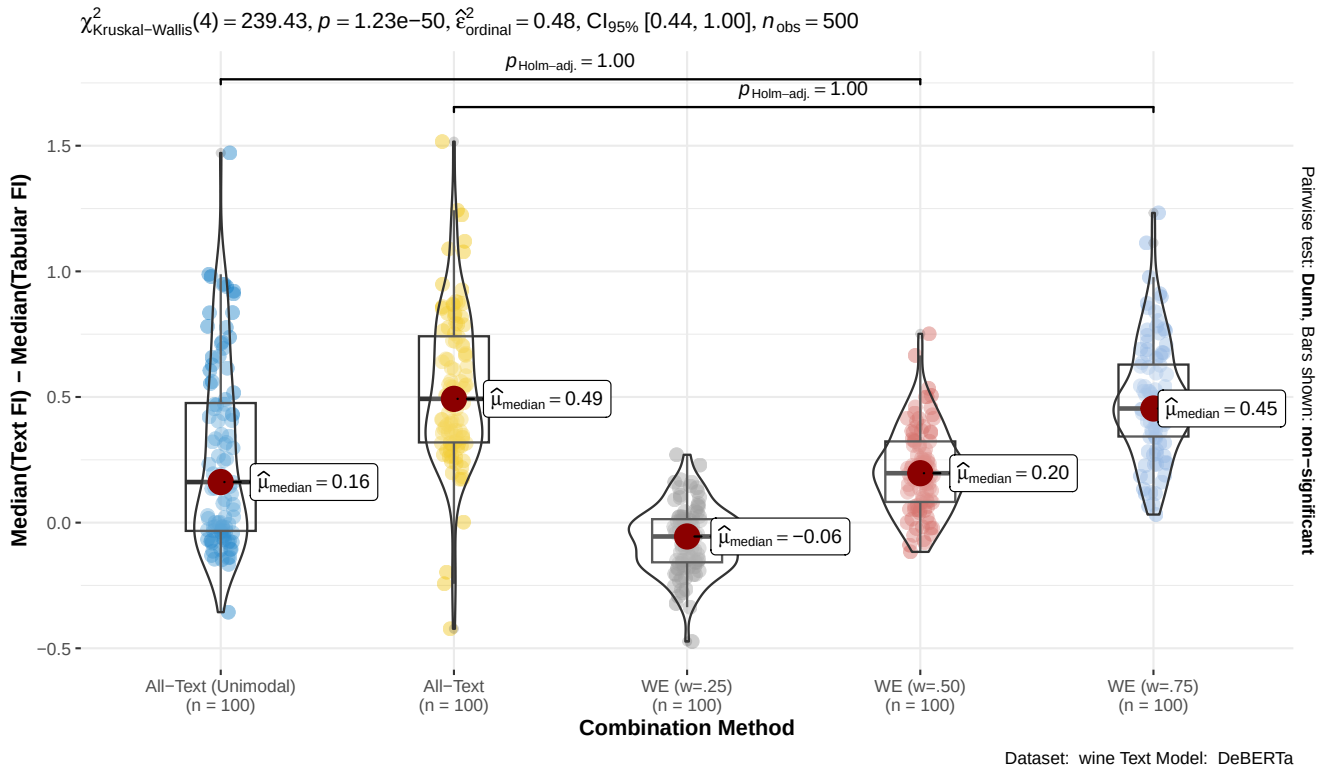


Figure 34. Median Text and Tabular Feature Importances Compared, by Combination Method, on the *wine* dataset with DeBERTa text model. WE: *Weighted-Ensemble*.

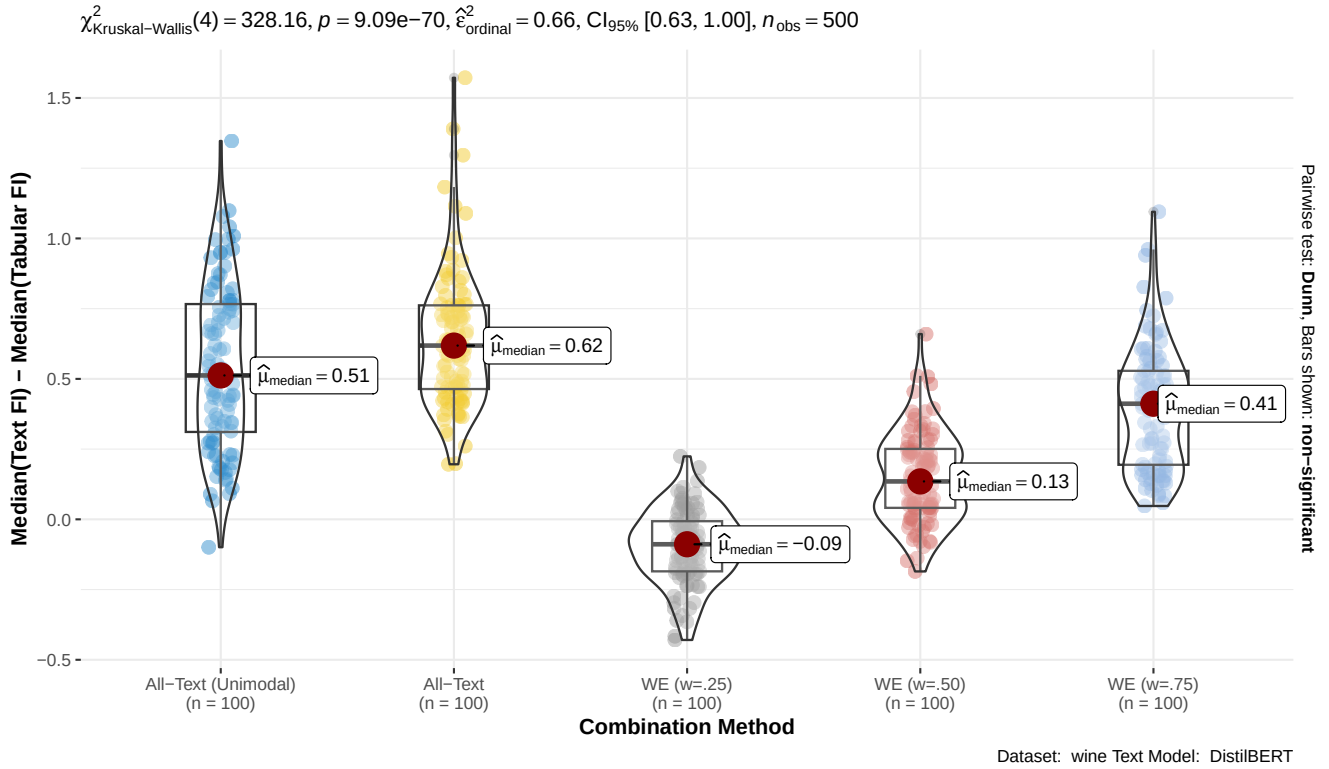


Figure 35. Median Text and Tabular Feature Importances Compared, by Combination Method, on the *wine* dataset with DistilBERT text model. WE: *Weighted-Ensemble*.

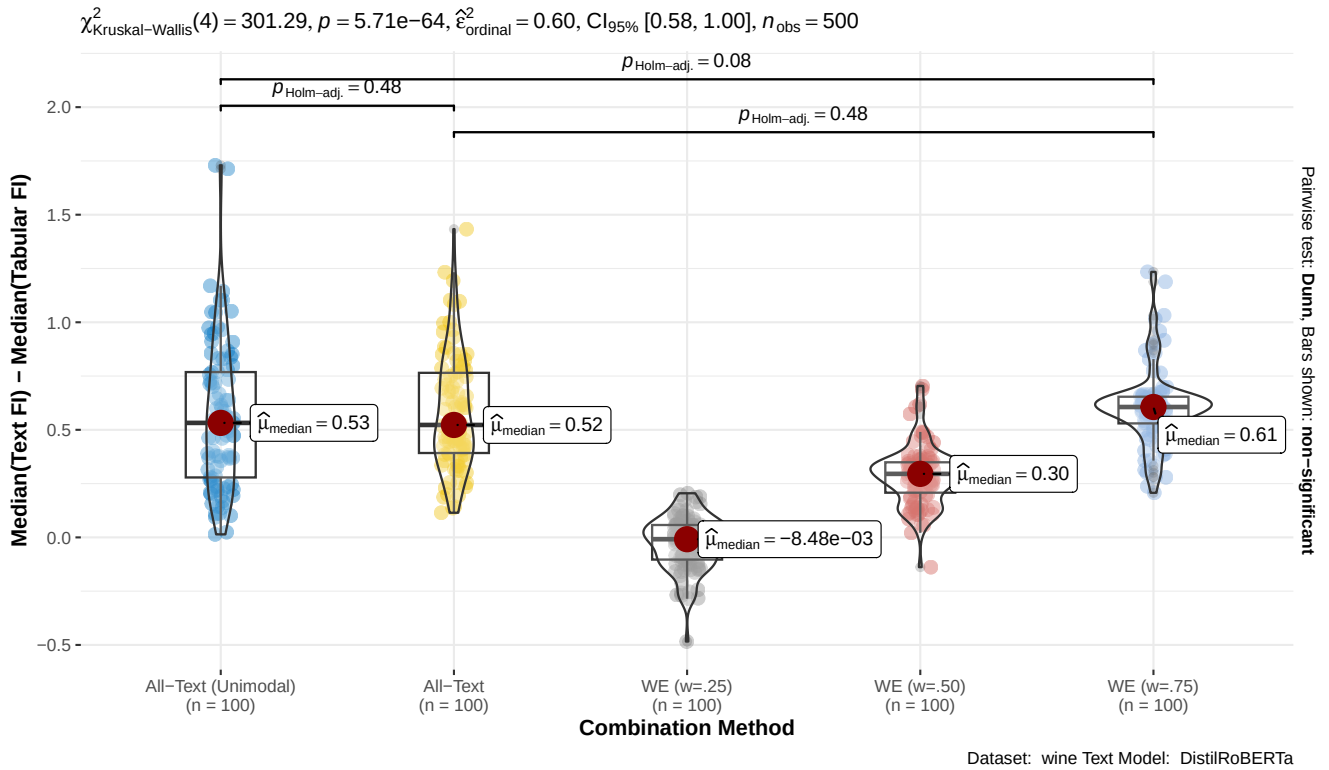


Figure 36. Median Text and Tabular Feature Importances Compared, by Combination Method, on the *wine* dataset with DistilRoBERTa text model. WE: *Weighted-Ensemble*.

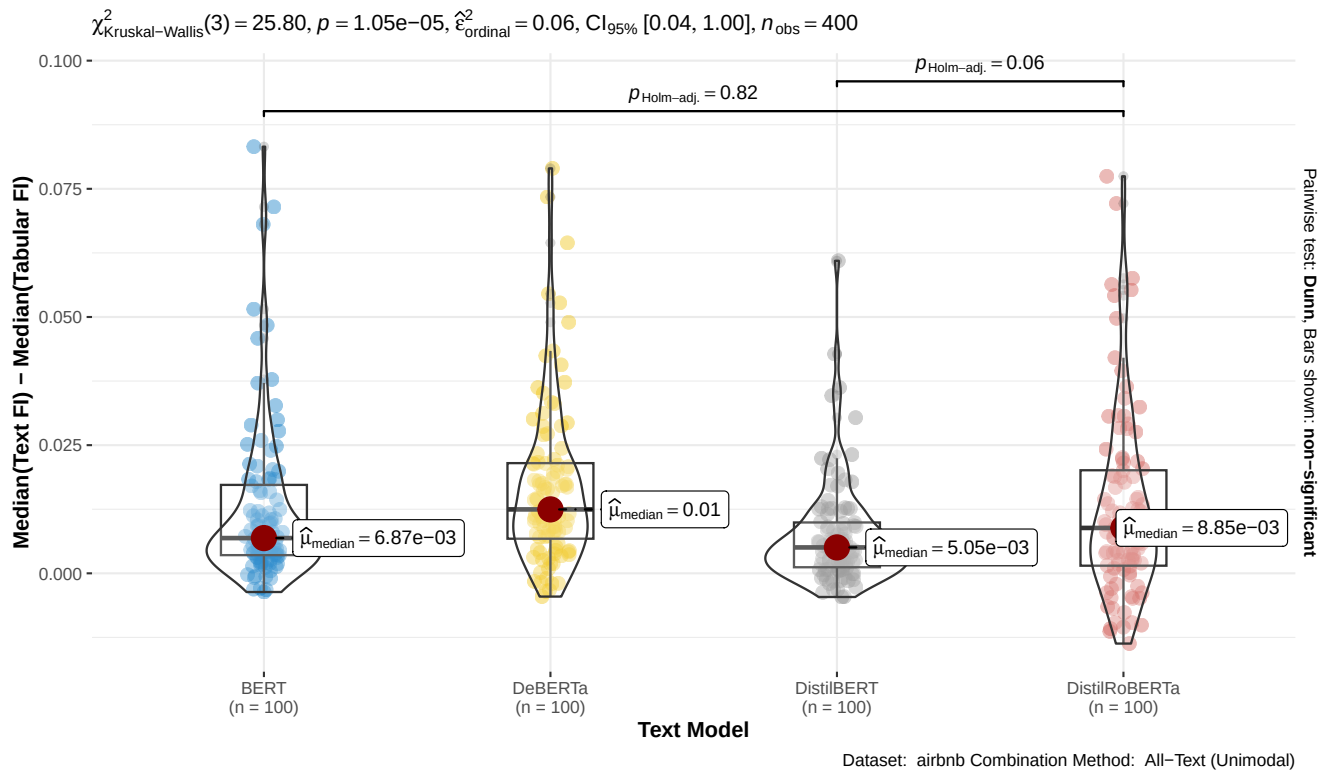


Figure 37. Median Text and Tabular Feature Importances Compared, by Text Model, on the *airbnb* dataset with *All-Text (Unimodal)* combination method.

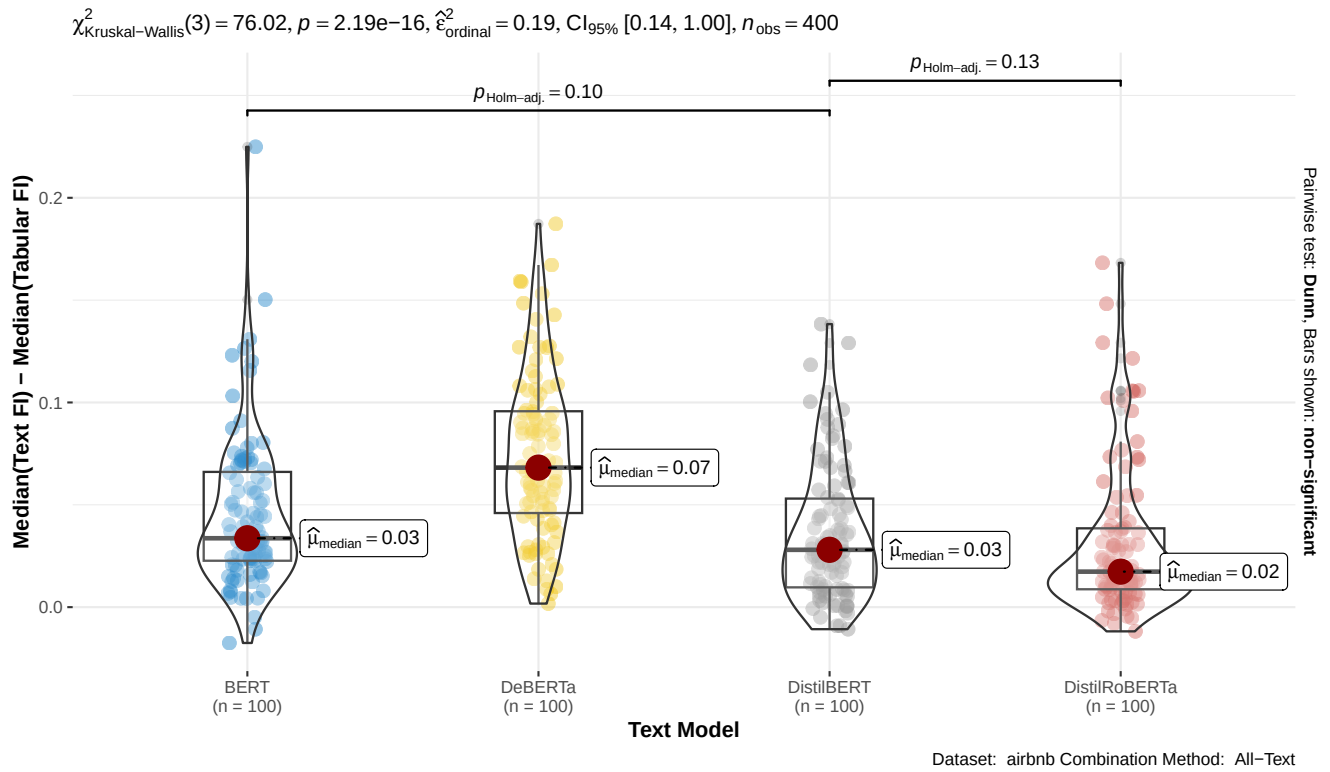


Figure 38. Median Text and Tabular Feature Importances Compared, by Text Model, on the *airbnb* dataset with *All-Text* combination method

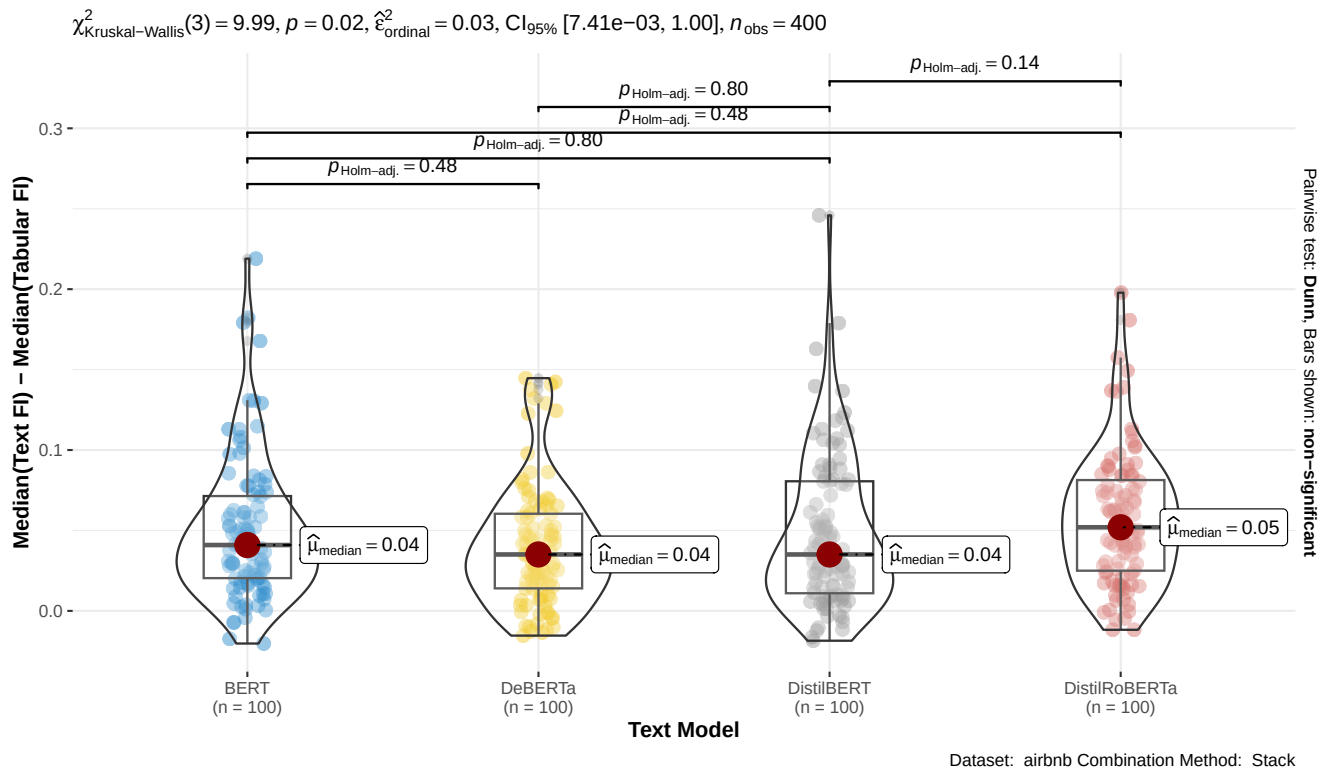


Figure 39. Median Text and Tabular Feature Importances Compared, by Text Model, on the *airbnb* dataset with *Stack* combination method

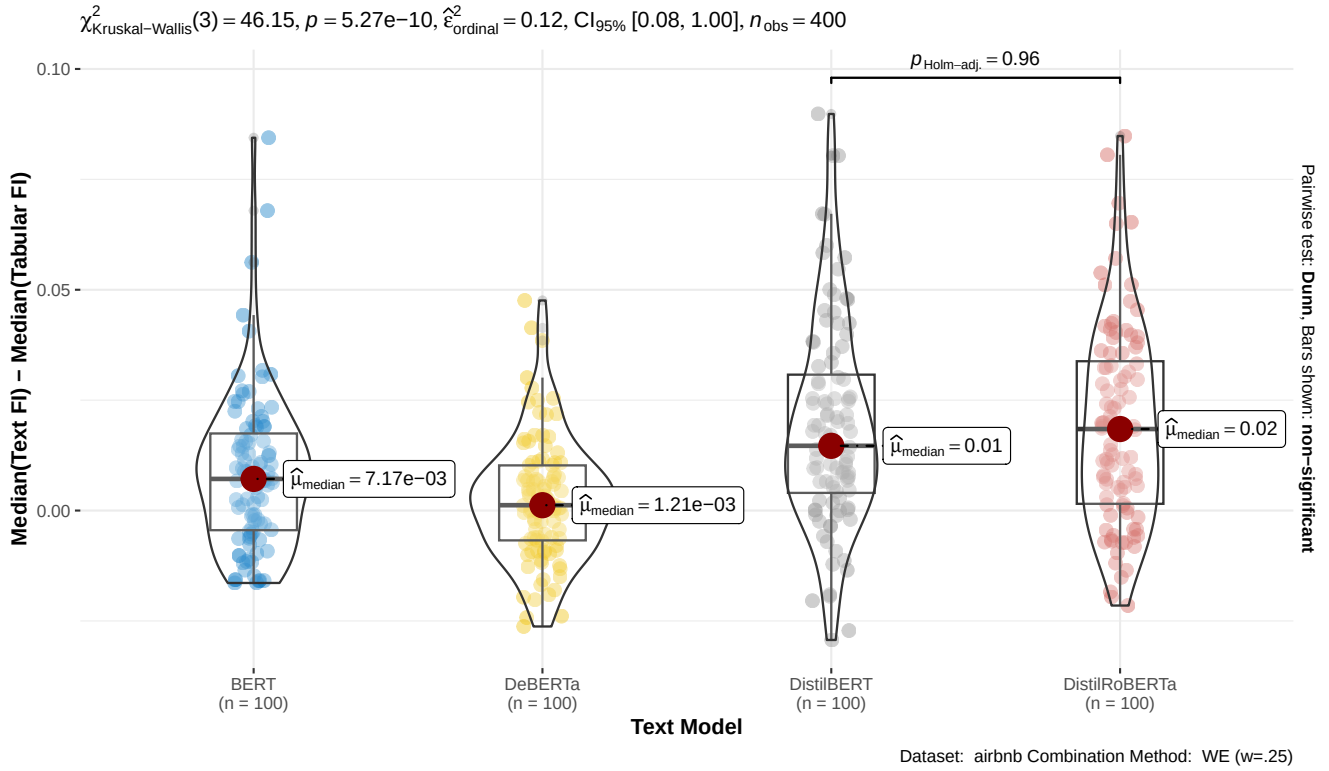


Figure 40. Median Text and Tabular Feature Importances Compared, by Text Model, on the *airbnb* dataset with *Weighted-Ensemble* ($w=.25$) combination method

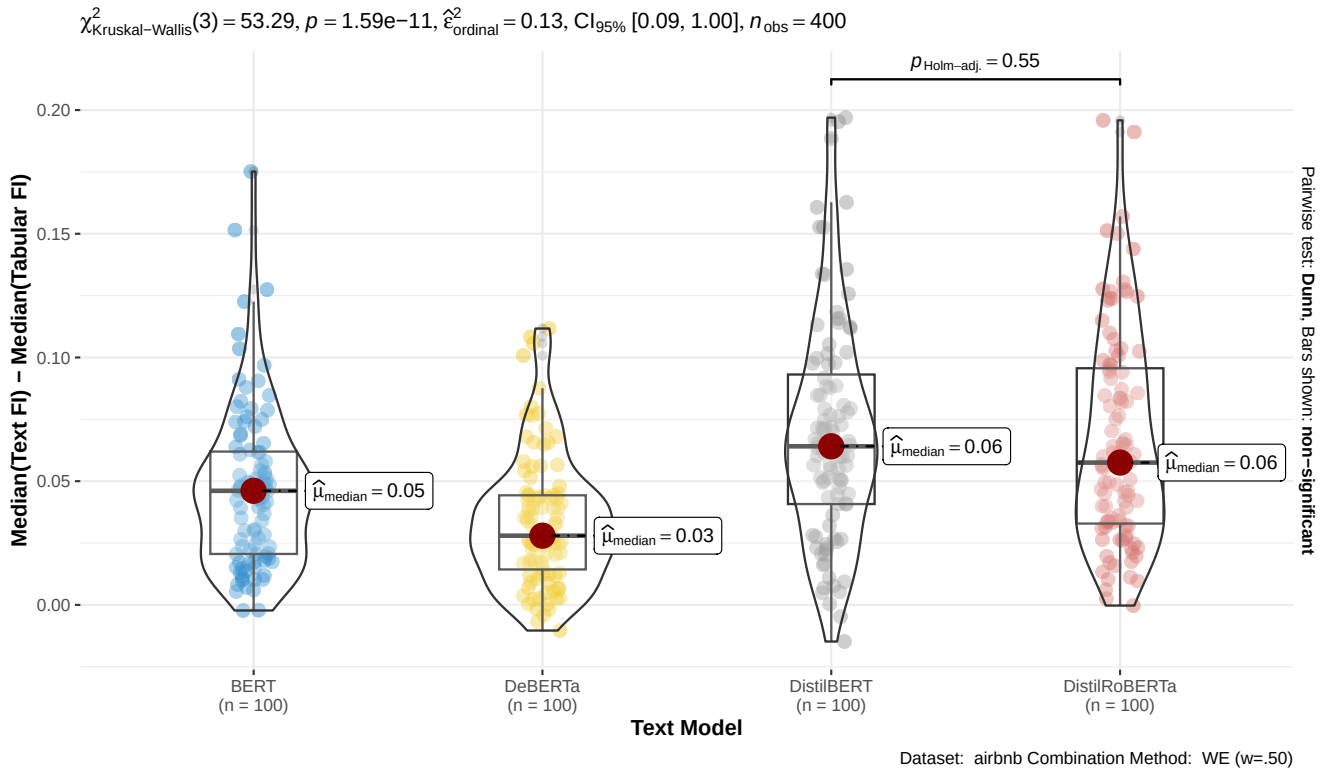


Figure 41. Median Text and Tabular Feature Importances Compared, by Text Model, on the *airbnb* dataset with *Weighted-Ensemble* ($w=.50$) combination method

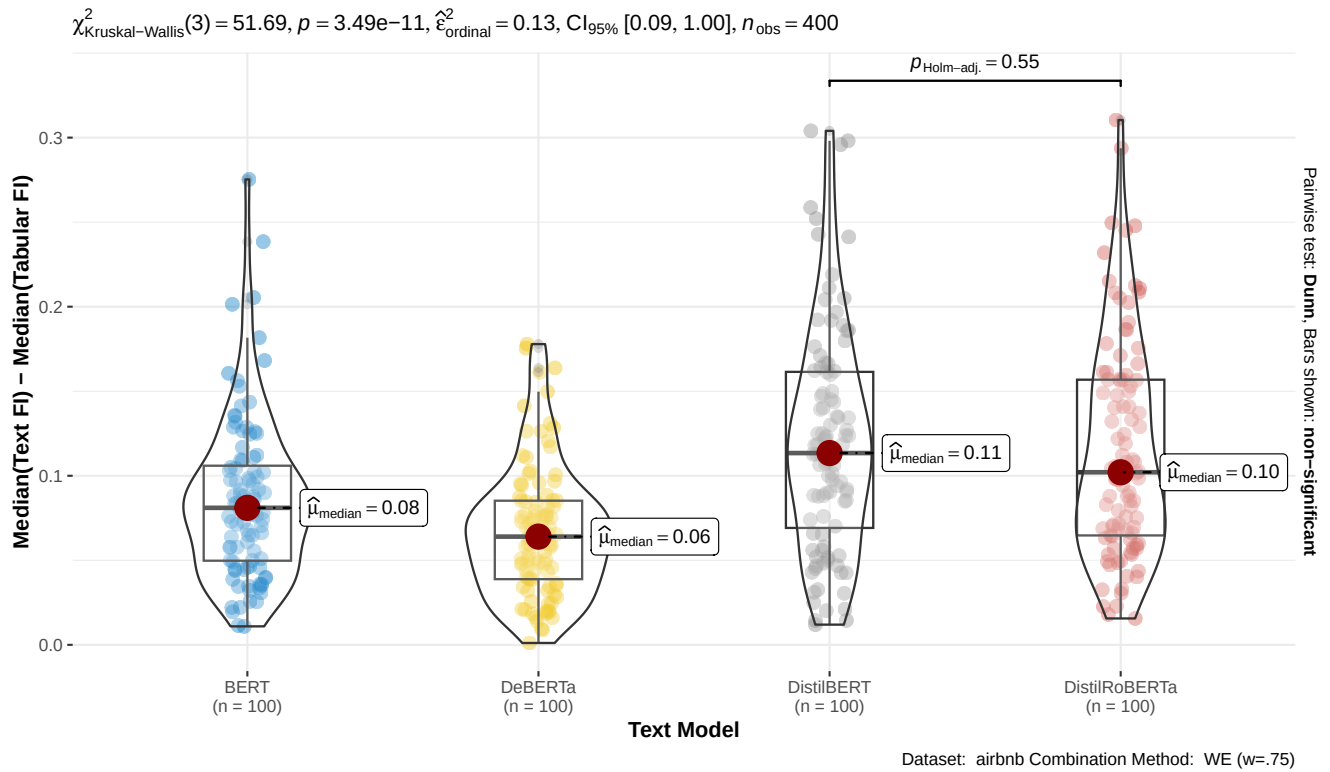


Figure 42. Median Text and Tabular Feature Importances Compared, by Text Model, on the *airbnb* dataset with *Weighted-Ensemble* ($w=.75$) combination method

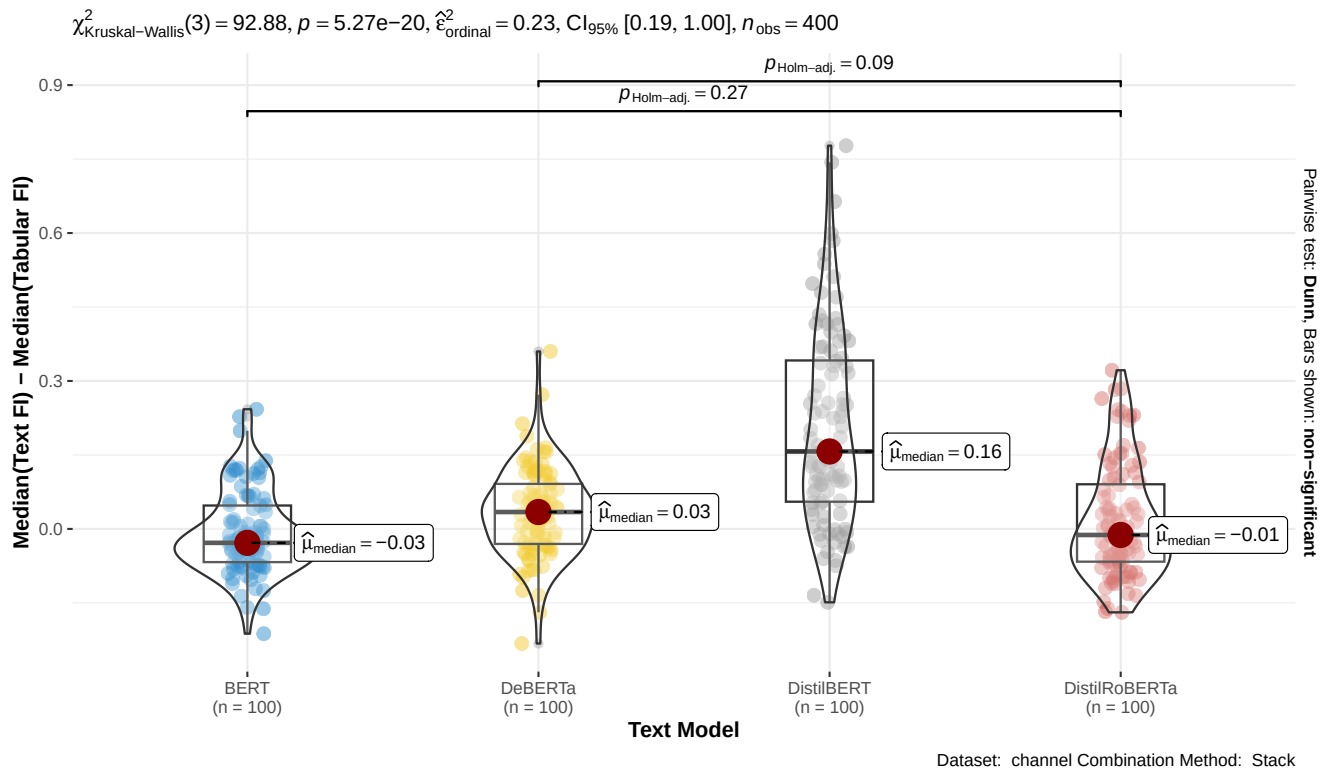


Figure 43. Median Text and Tabular Feature Importances Compared, by Text Model, on the *channel* dataset with *Stack* combination method

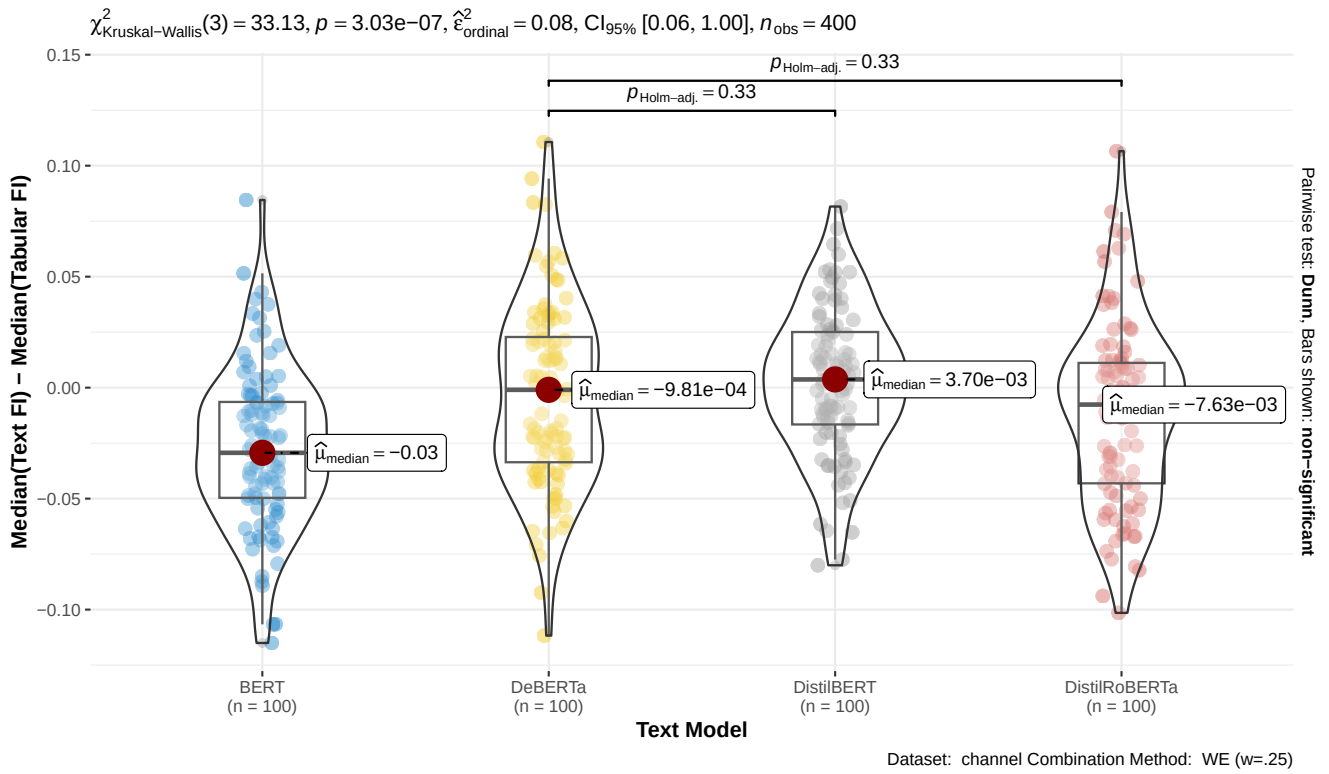


Figure 44. Median Text and Tabular Feature Importances Compared, by Text Model, on the *channel* dataset with *Weighted-Ensemble* ($w=.25$) combination method

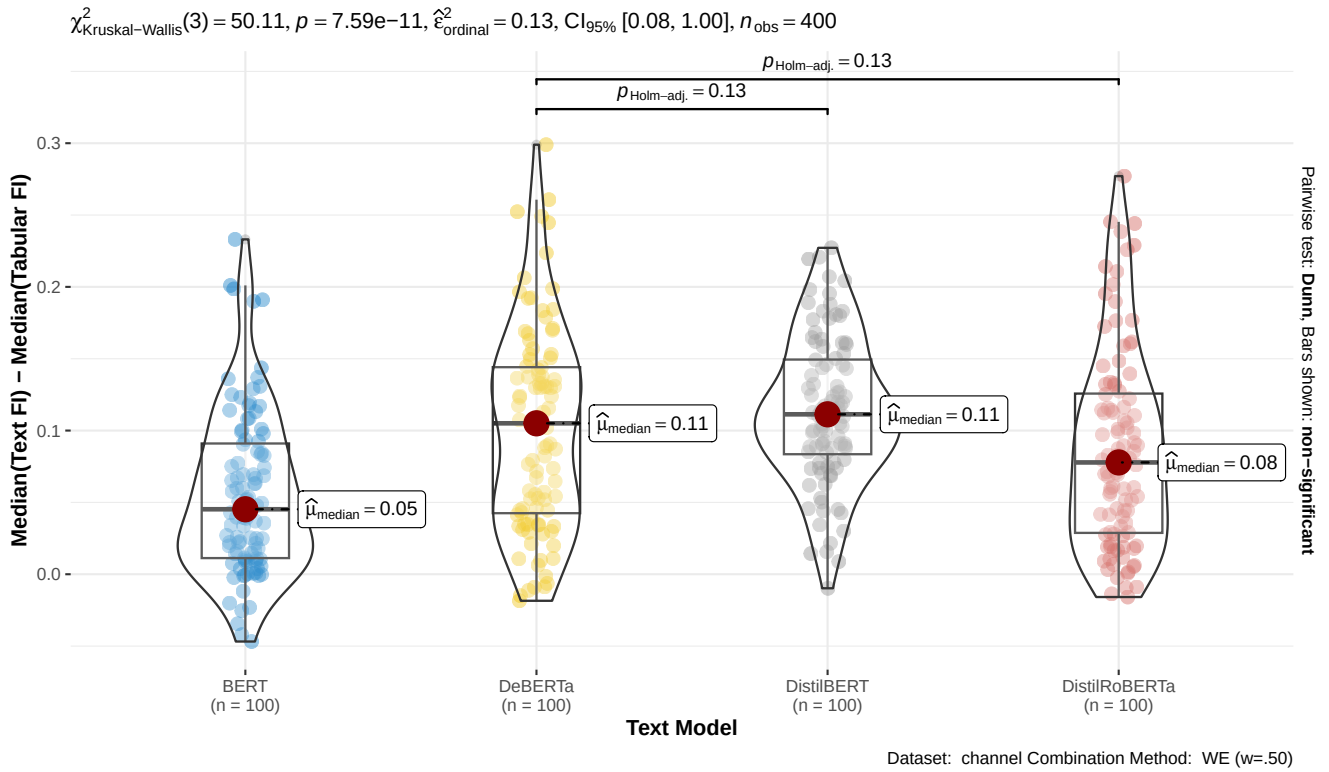


Figure 45. Median Text and Tabular Feature Importances Compared, by Text Model, on the *channel* dataset with *Weighted-Ensemble* ($w=.50$) combination method

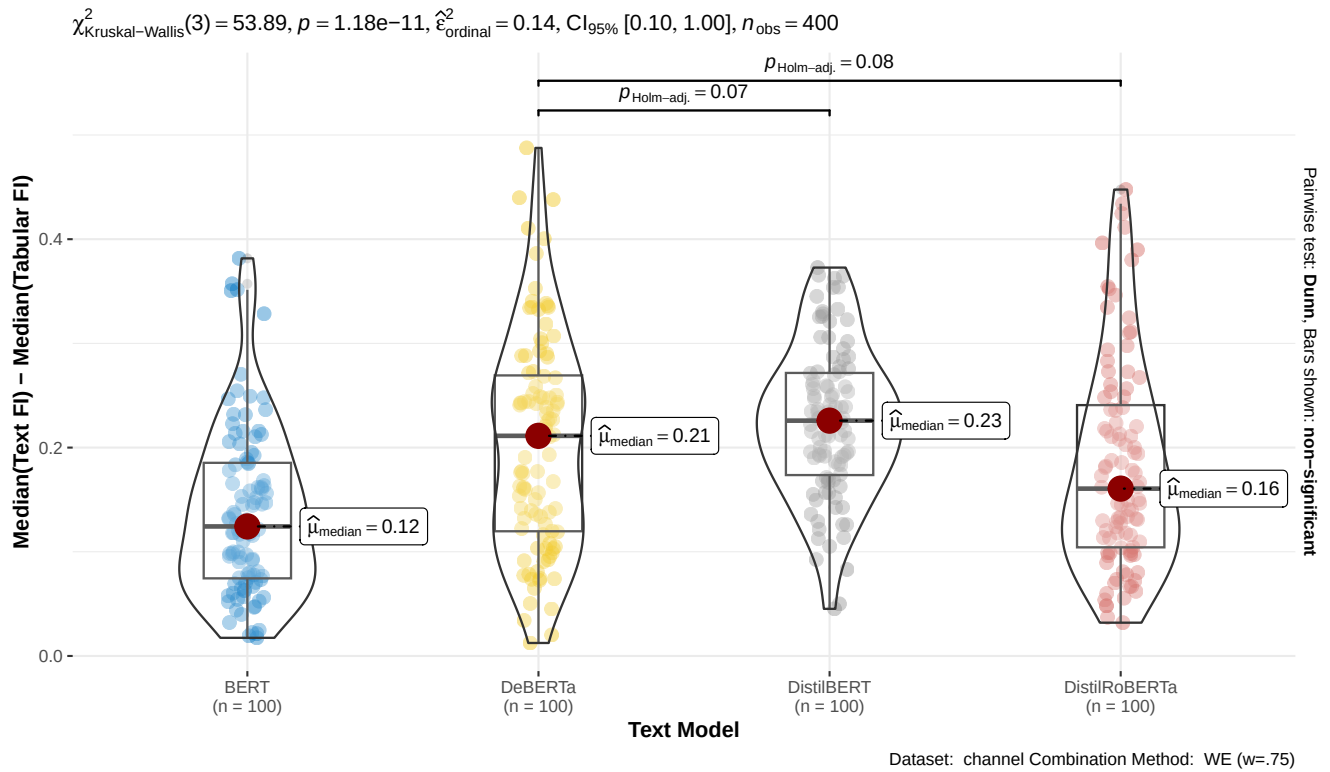


Figure 46. Median Text and Tabular Feature Importances Compared, by Text Model, on the *channel* dataset with *Weighted-Ensemble* ($w=.75$) combination method

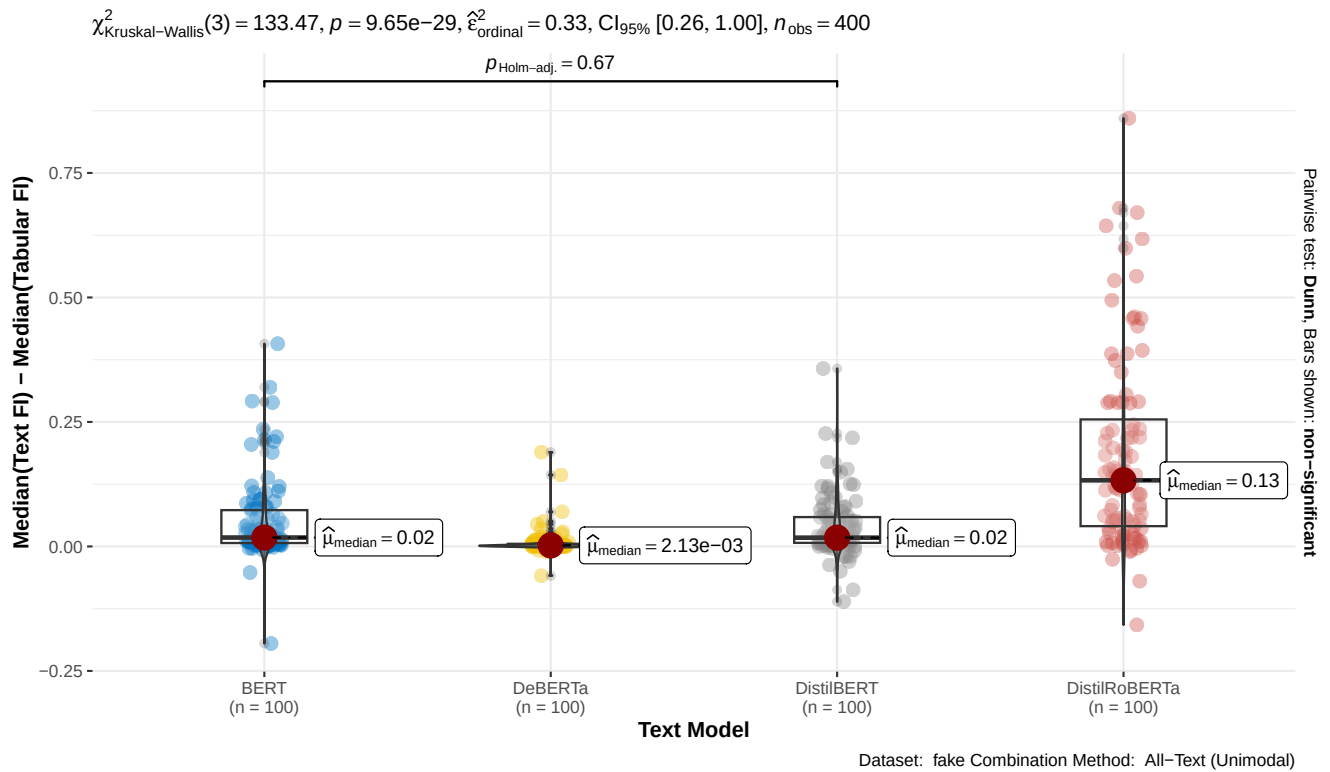


Figure 47. Median Text and Tabular Feature Importances Compared, by Text Model, on the *fake* dataset with *All-Text* (*Unimodal*) combination method.

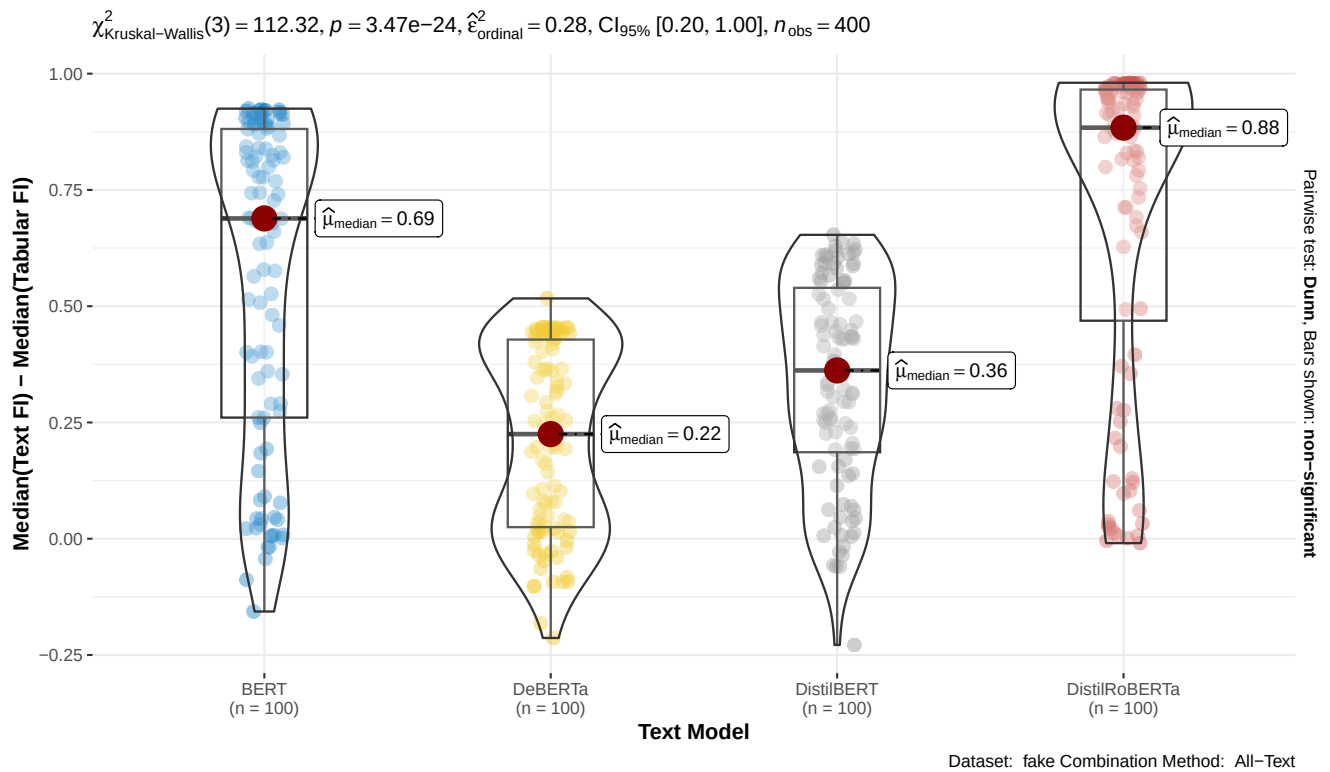


Figure 48. Median Text and Tabular Feature Importances Compared, by Text Model, on the *fake* dataset with *All-Text* combination method

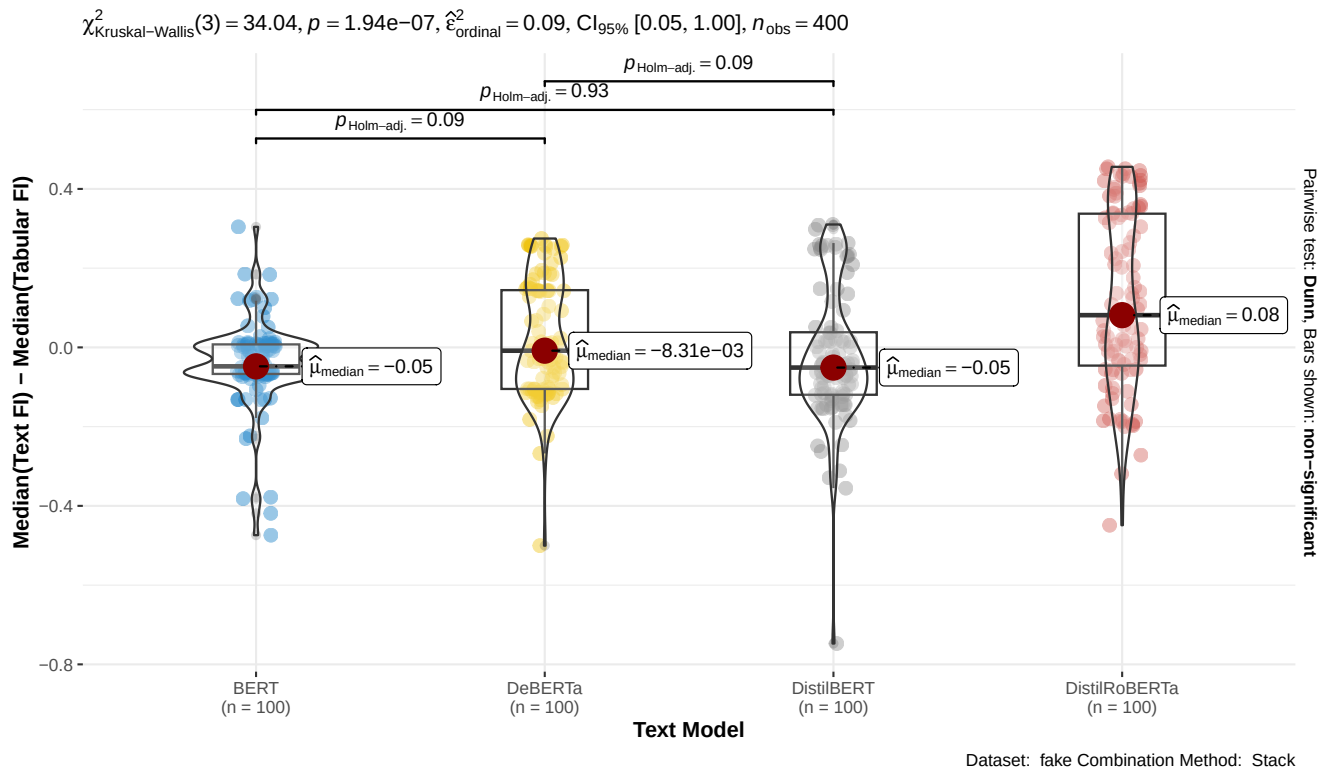


Figure 49. Median Text and Tabular Feature Importances Compared, by Text Model, on the *fake* dataset with *Stack* combination method

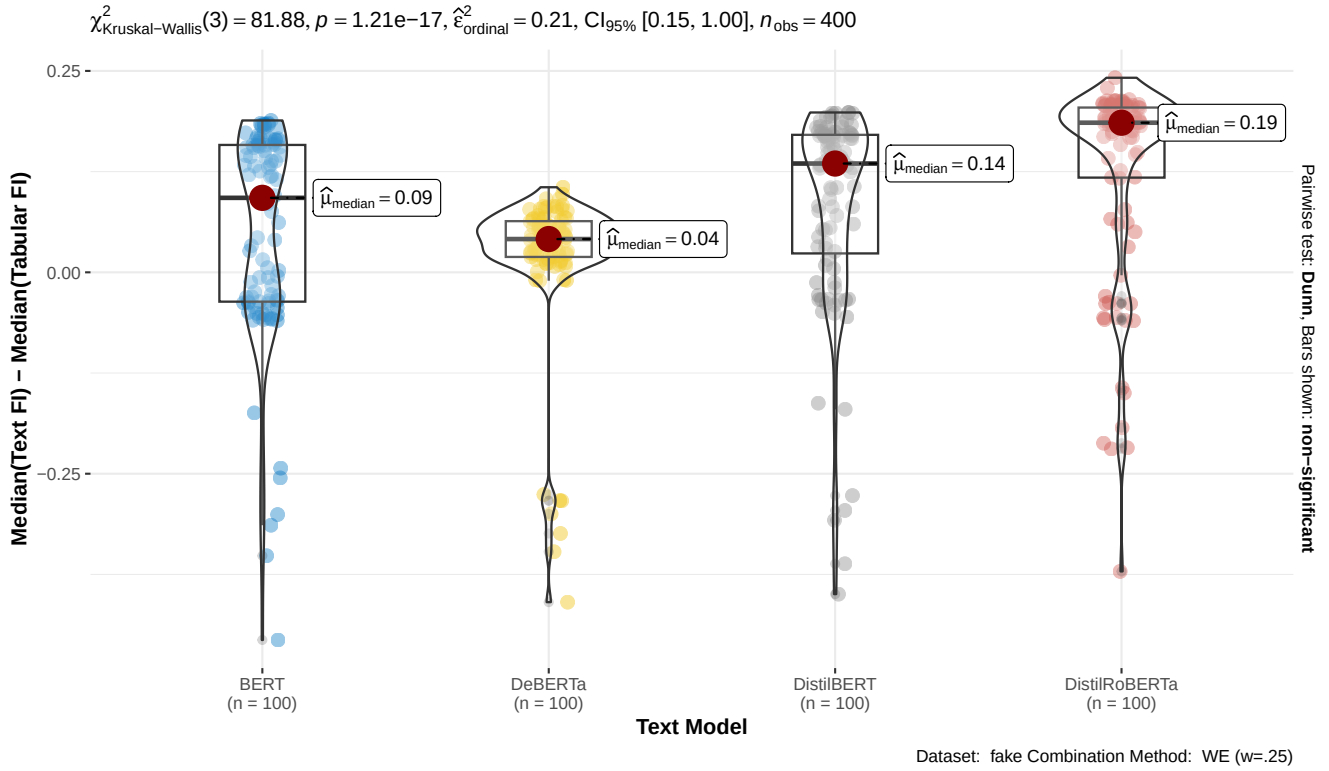


Figure 50. Median Text and Tabular Feature Importances Compared, by Text Model, on the *fake* dataset with *Weighted-Ensemble* ($w=.25$) combination method

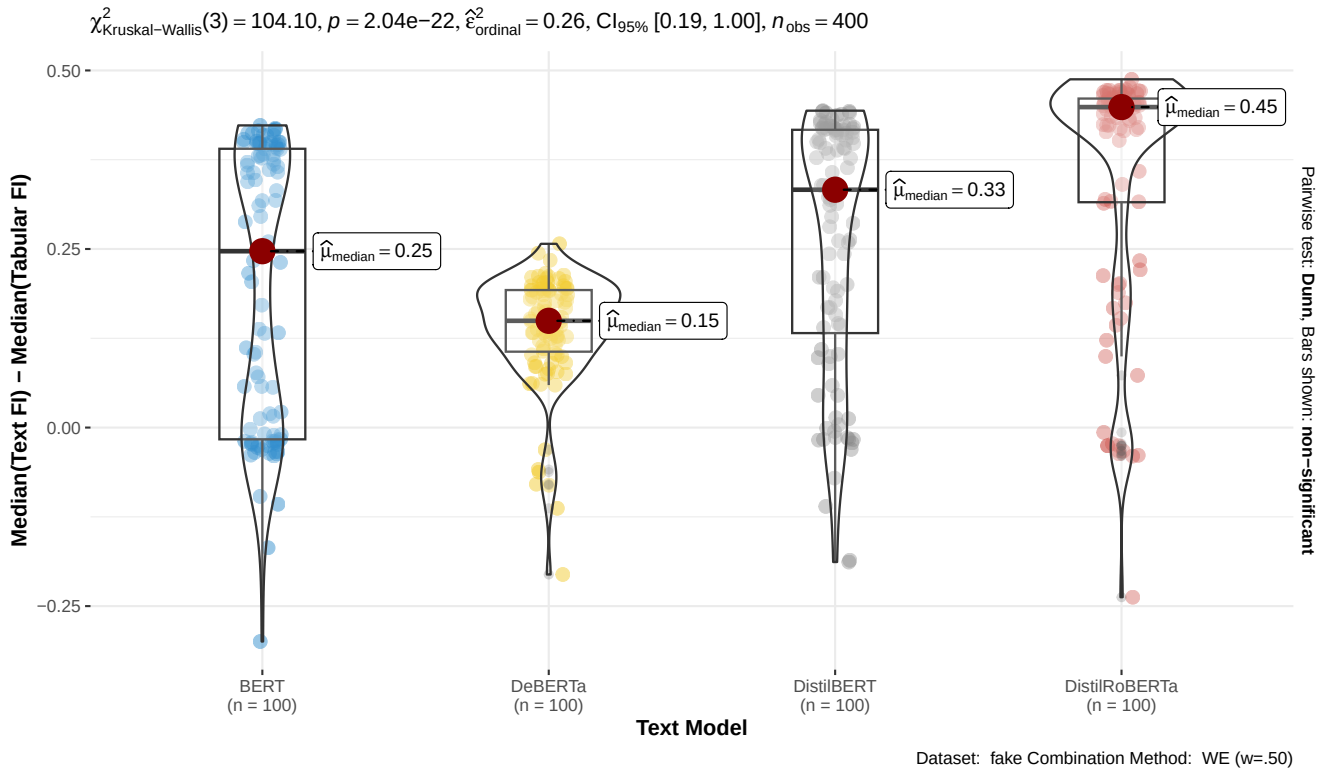


Figure 51. Median Text and Tabular Feature Importances Compared, by Text Model, on the *fake* dataset with *Weighted-Ensemble* ($w=.50$) combination method

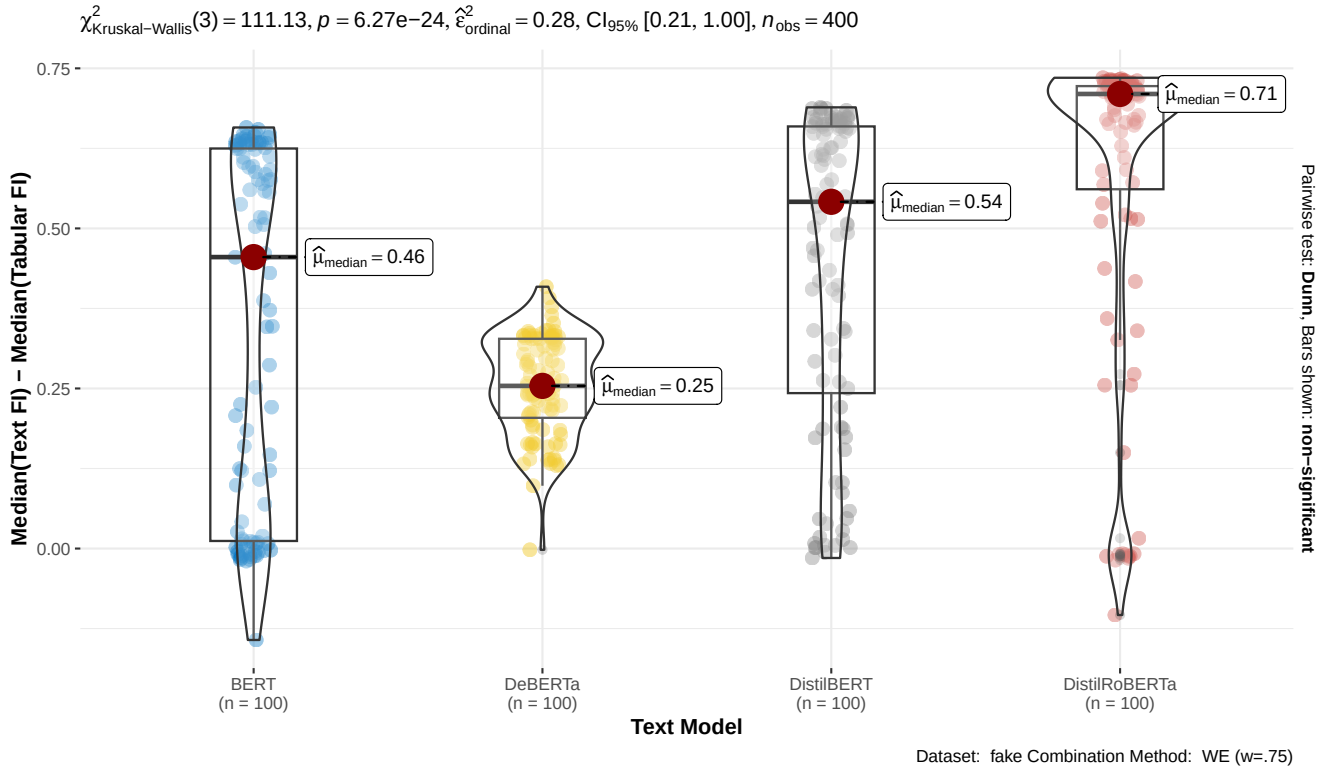


Figure 52. Median Text and Tabular Feature Importances Compared, by Text Model, on the *fake* dataset with *Weighted-Ensemble* ($w=.75$) combination method

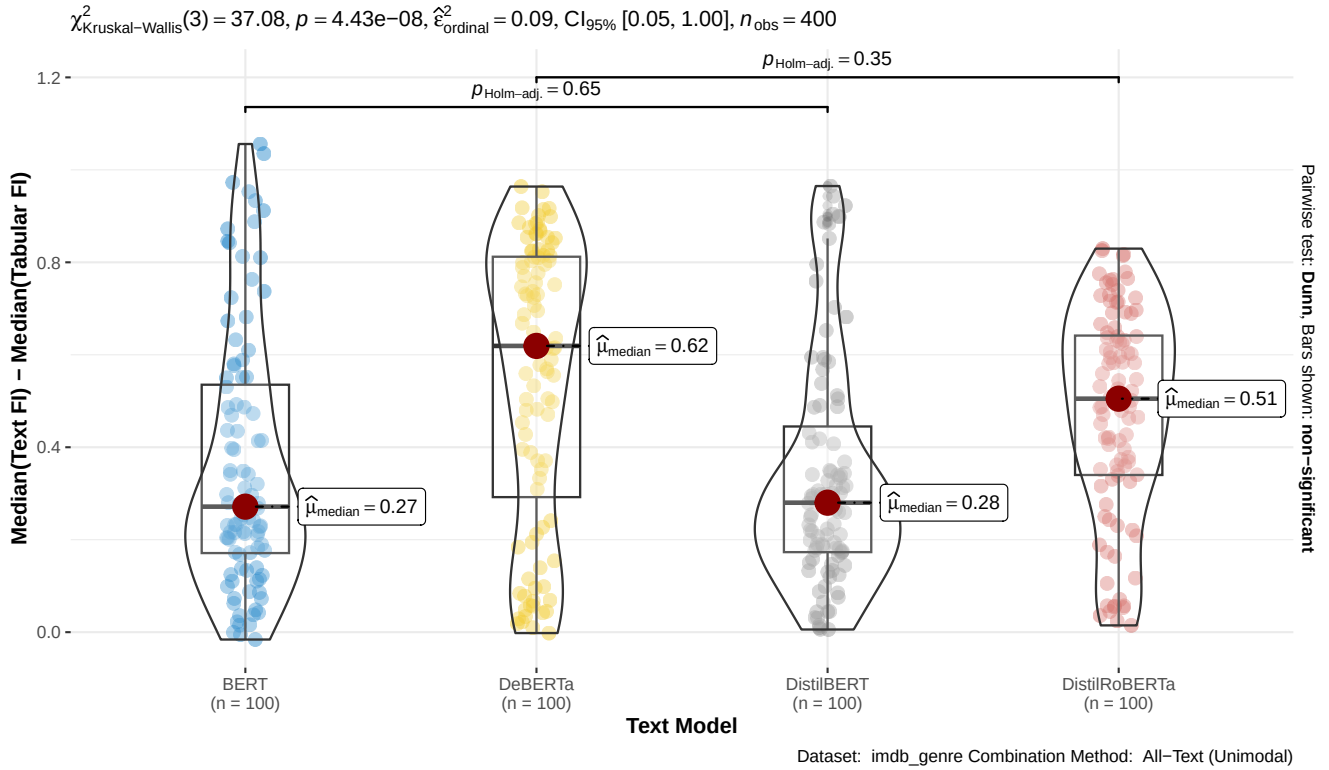


Figure 53. Median Text and Tabular Feature Importances Compared, by Text Model, on the *imdb* dataset with *All-Text* (*Unimodal*) combination method.

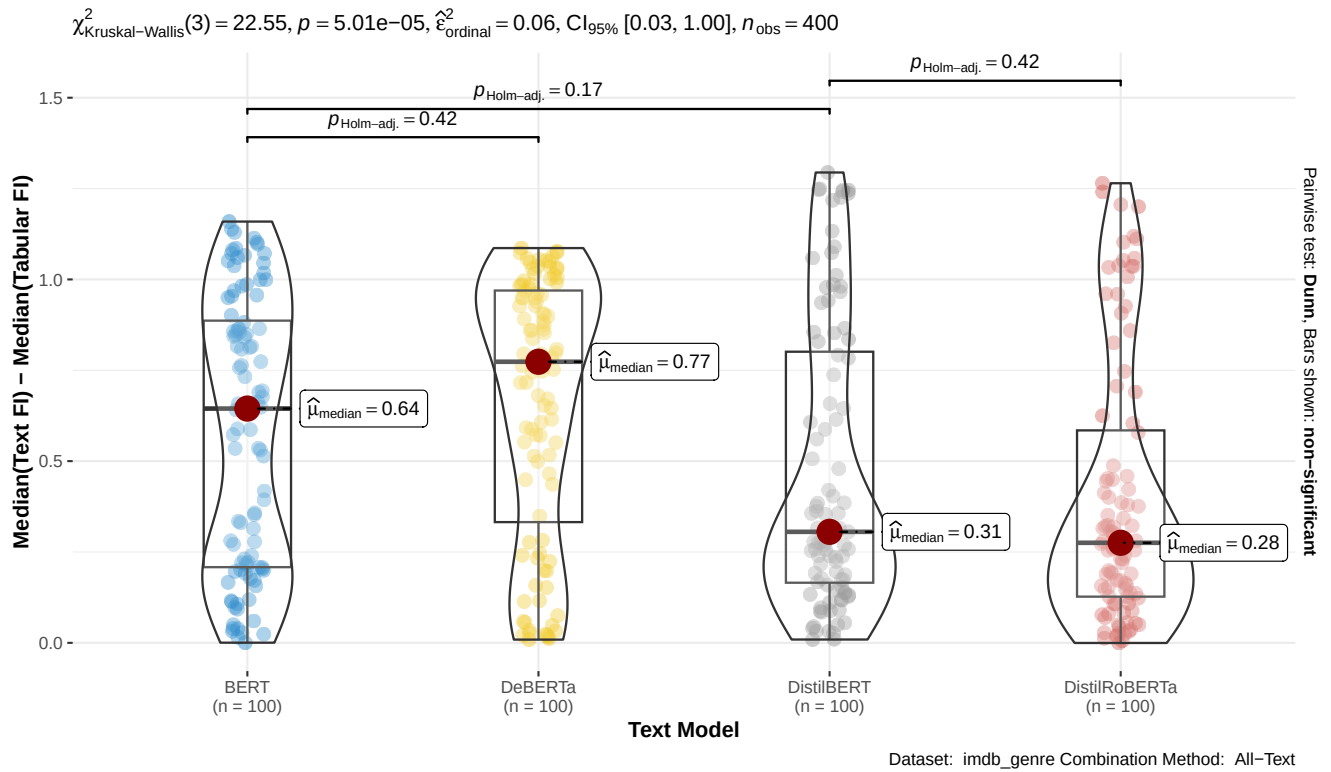


Figure 54. Median Text and Tabular Feature Importances Compared, by Text Model, on the *imdb* dataset with *All-Text* combination method

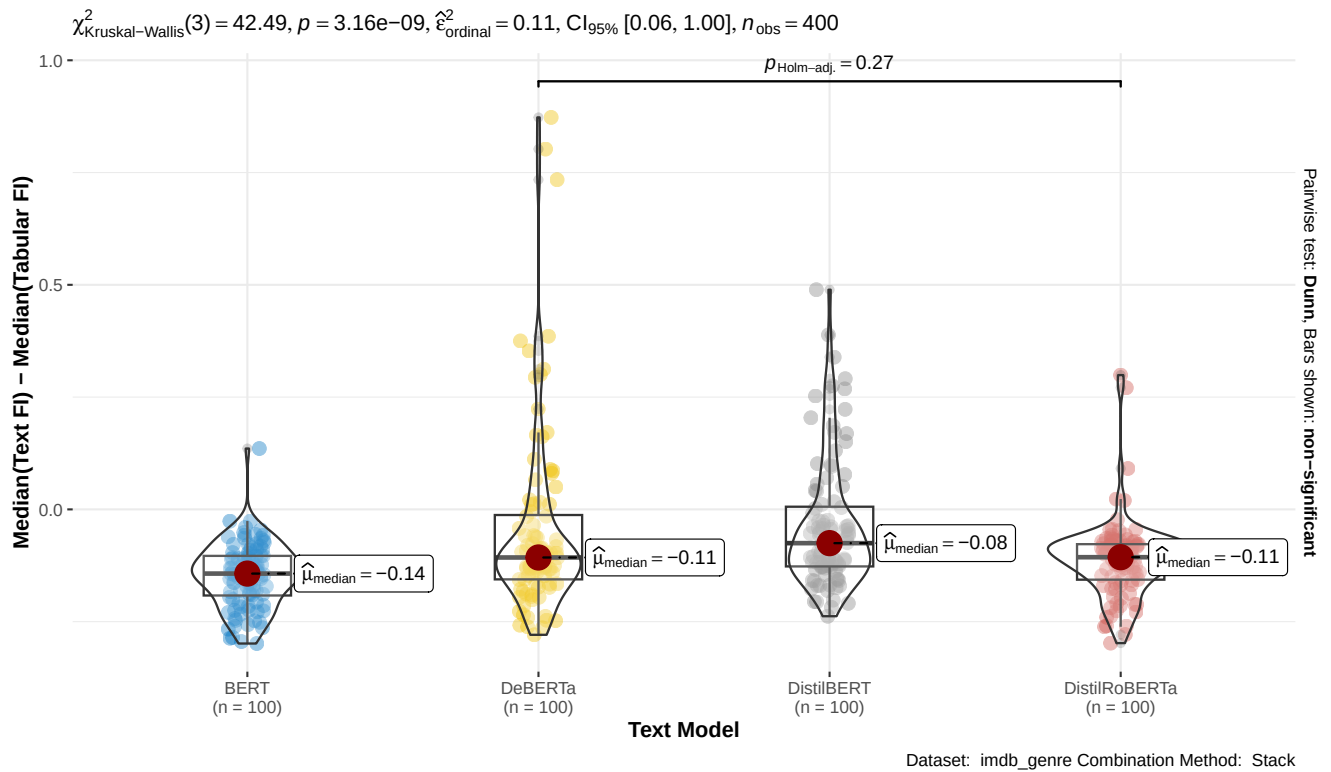


Figure 55. Median Text and Tabular Feature Importances Compared, by Text Model, on the *imdb* dataset with *Stack* combination method

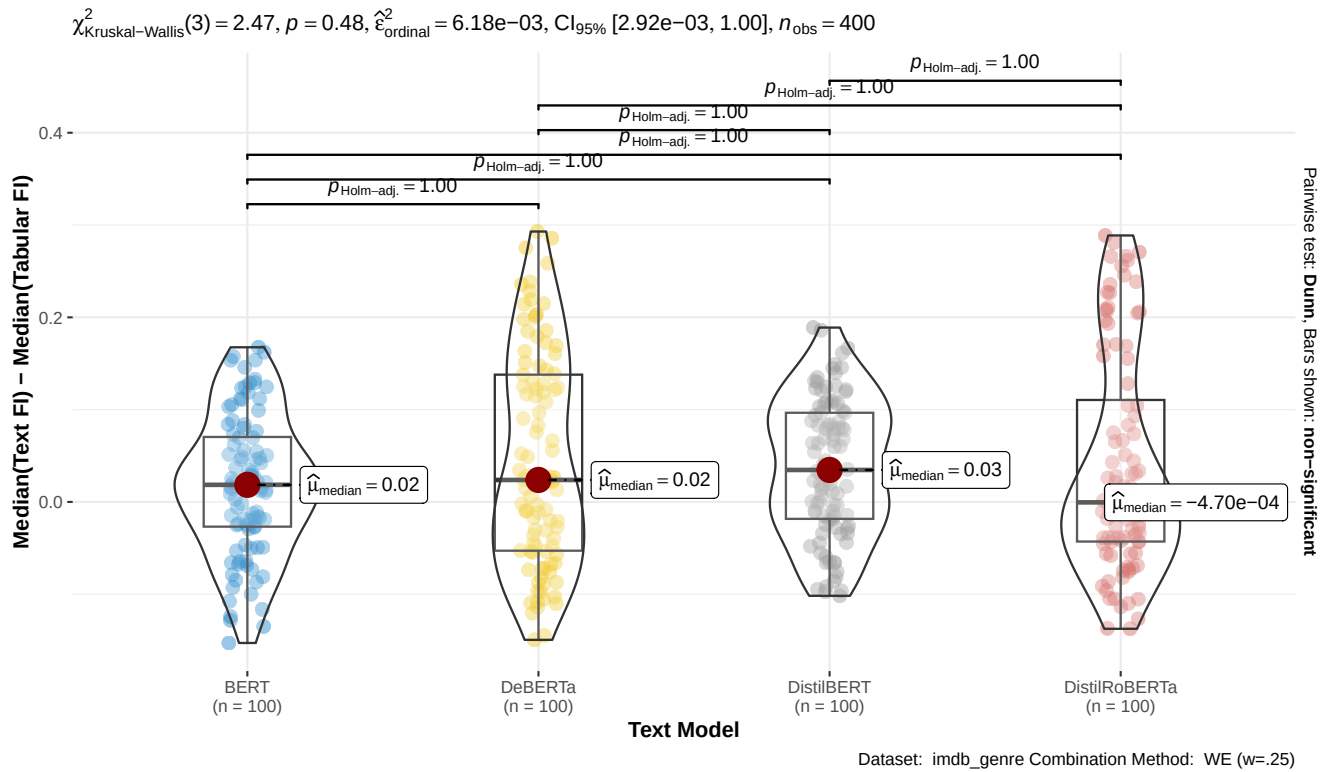


Figure 56. Median Text and Tabular Feature Importances Compared, by Text Model, on the *imdb* dataset with *Weighted-Ensemble* ($w=.25$) combination method

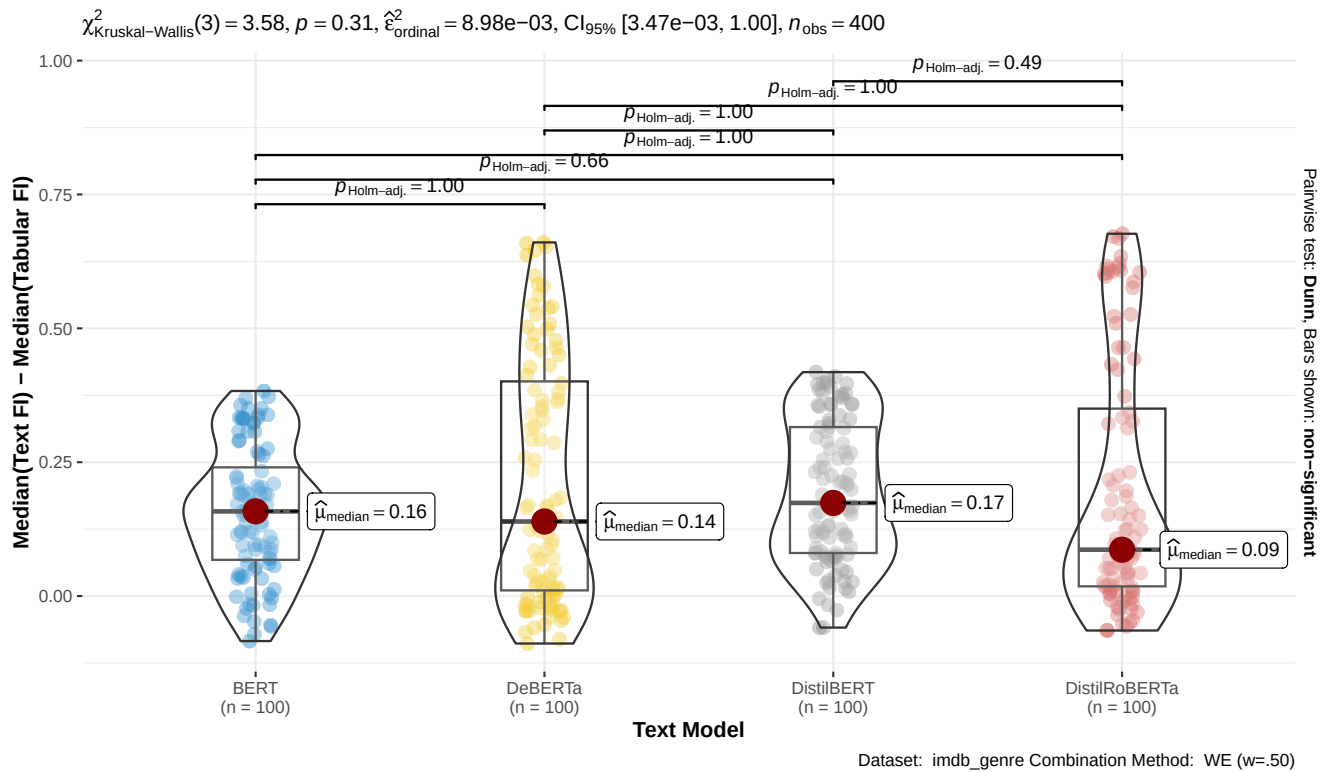


Figure 57. Median Text and Tabular Feature Importances Compared, by Text Model, on the *imdb* dataset with *Weighted-Ensemble* ($w=.50$) combination method

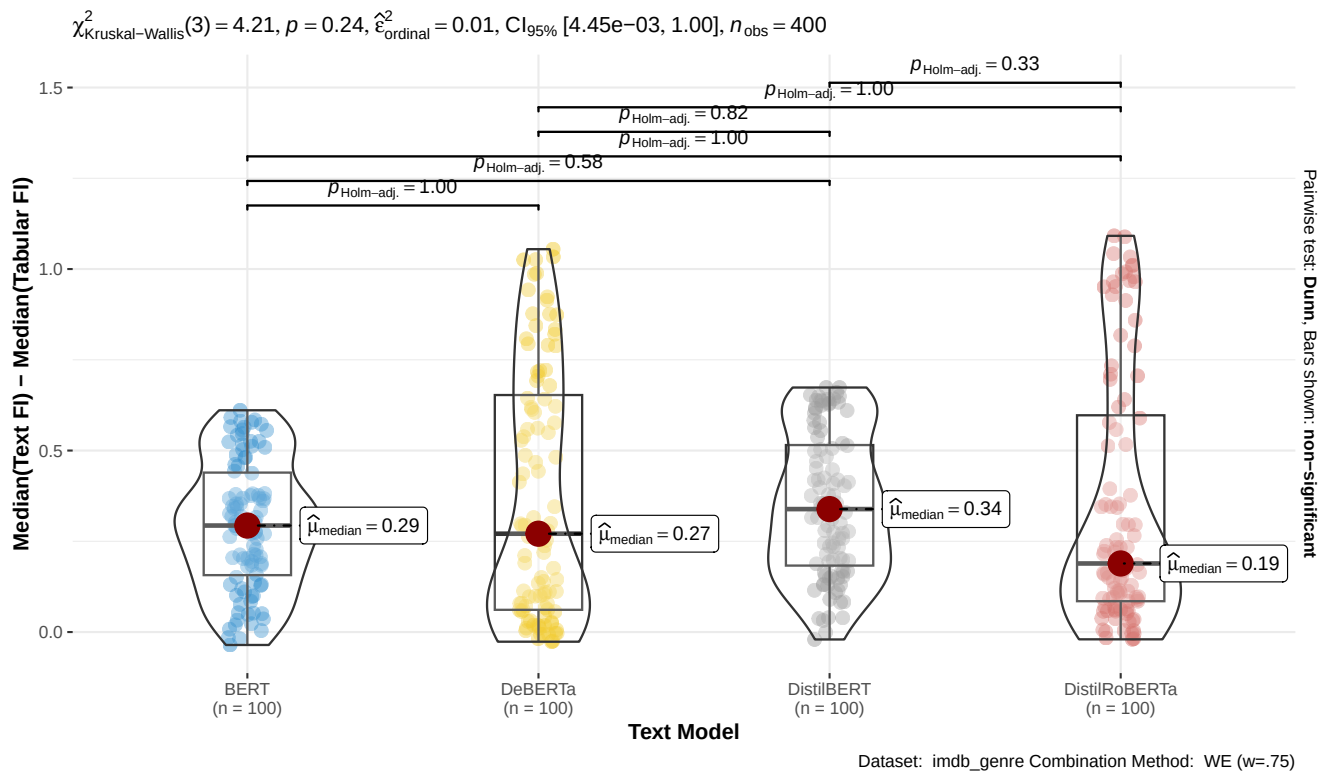


Figure 58. Median Text and Tabular Feature Importances Compared, by Text Model, on the *imdb* dataset with *Weighted-Ensemble* ($w=.75$) combination method

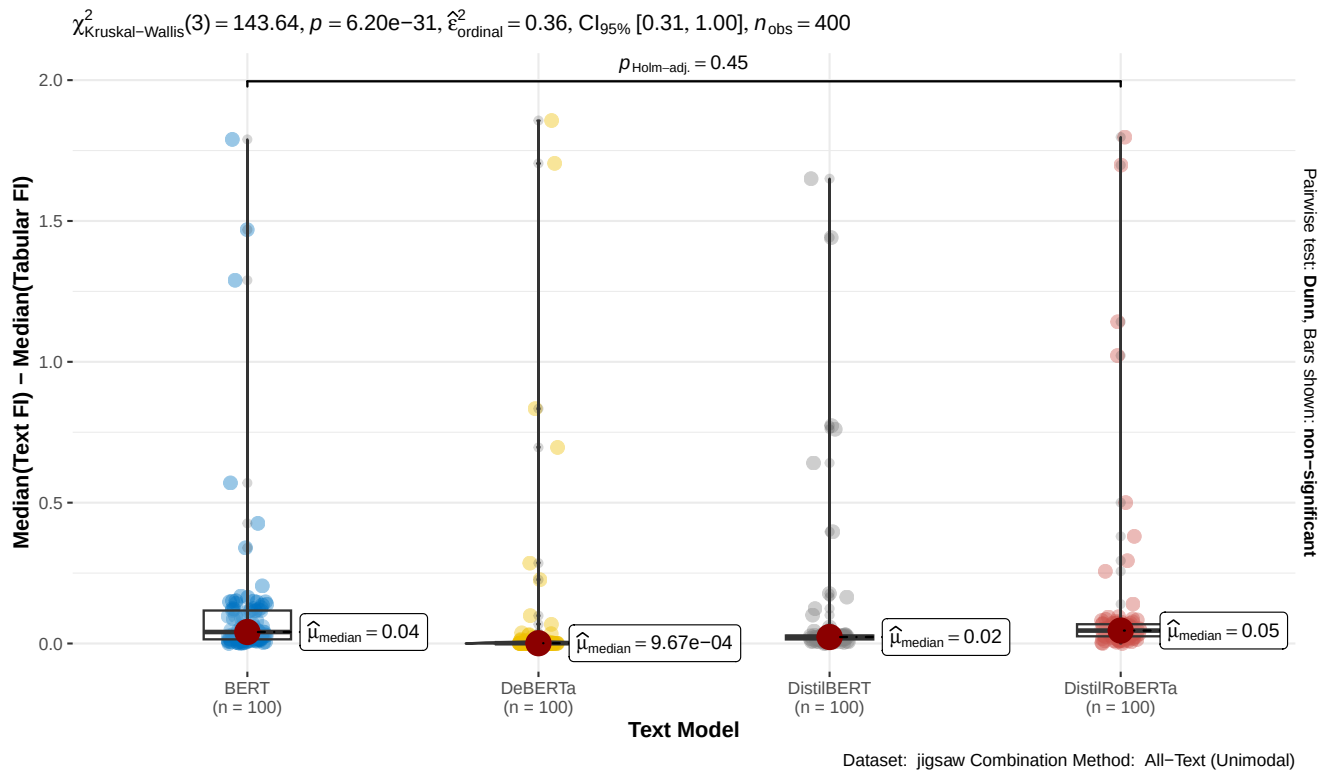


Figure 59. Median Text and Tabular Feature Importances Compared, by Text Model, on the *jigsaw* dataset with *All-Text* (*Unimodal*) combination method.

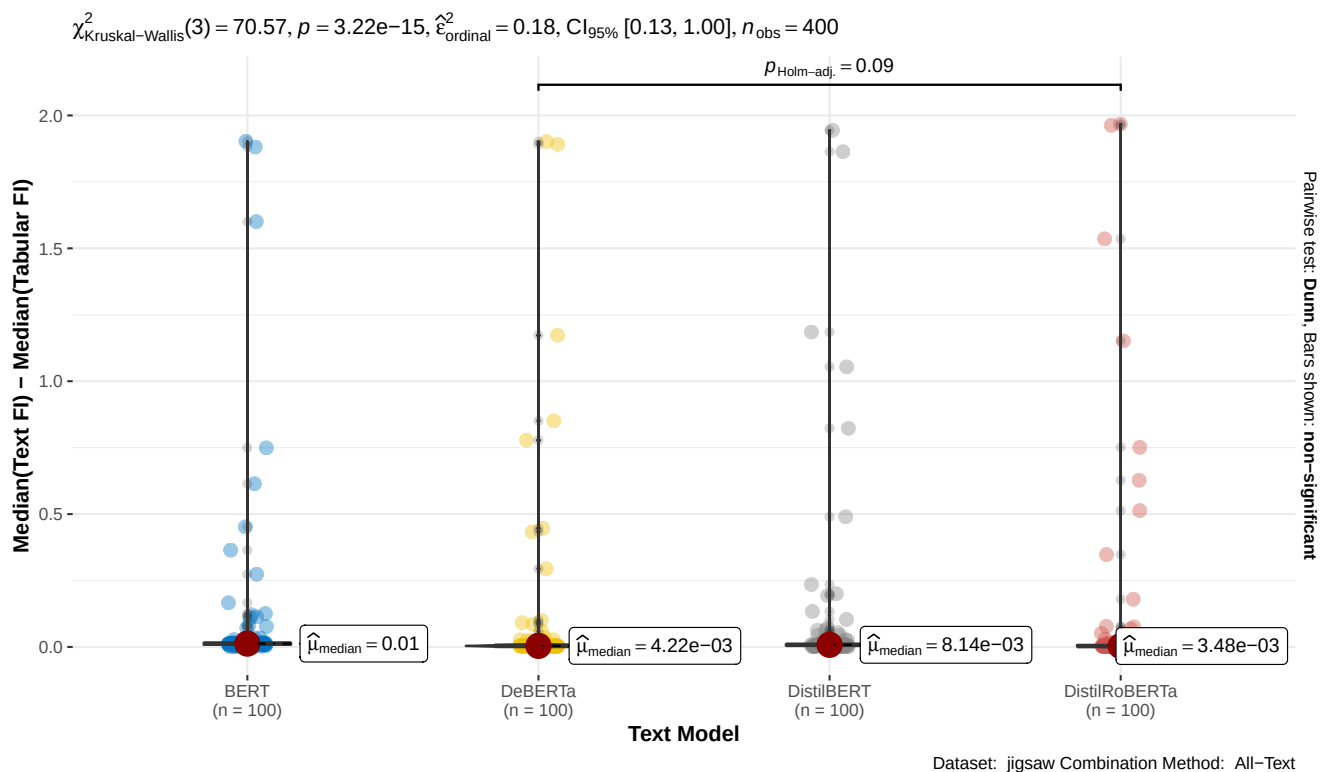


Figure 60. Median Text and Tabular Feature Importances Compared, by Text Model, on the *jigsaw* dataset with *All-Text* combination method

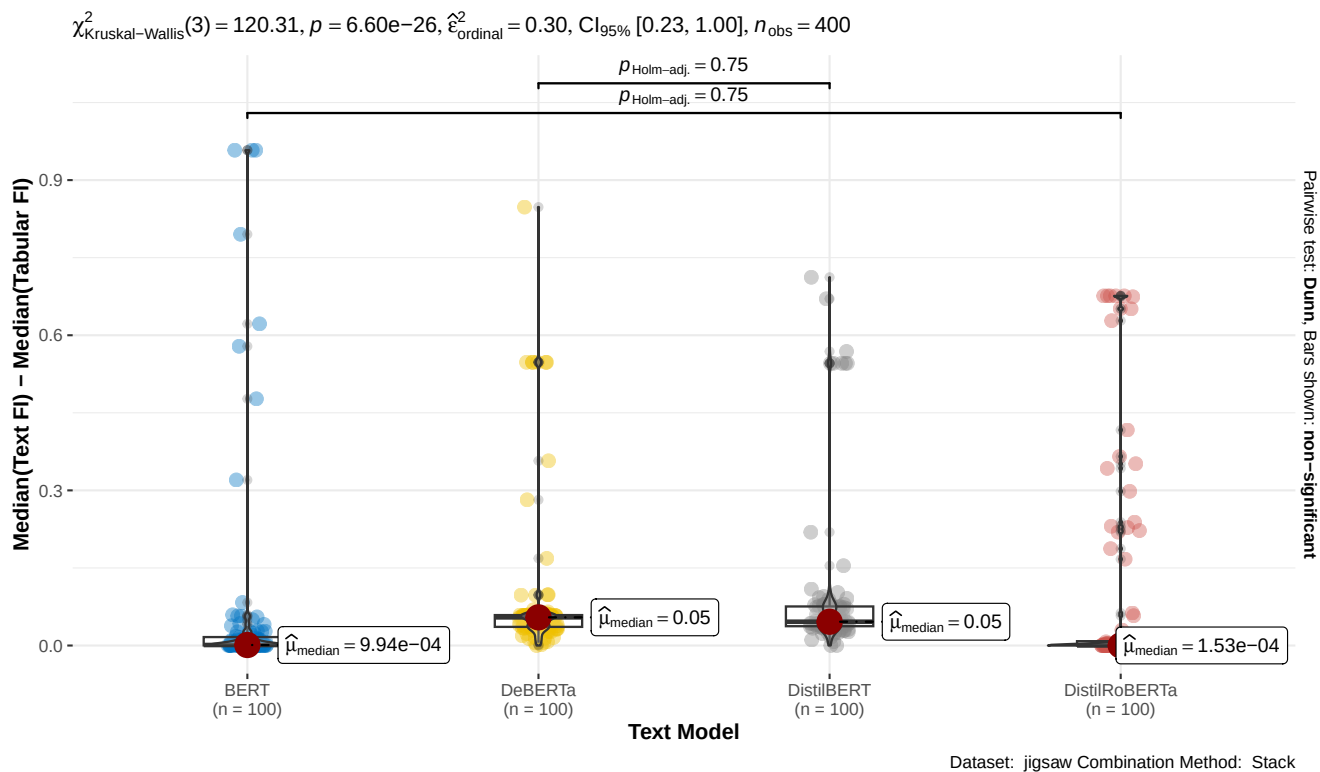


Figure 61. Median Text and Tabular Feature Importances Compared, by Text Model, on the *jigsaw* dataset with *Stack* combination method

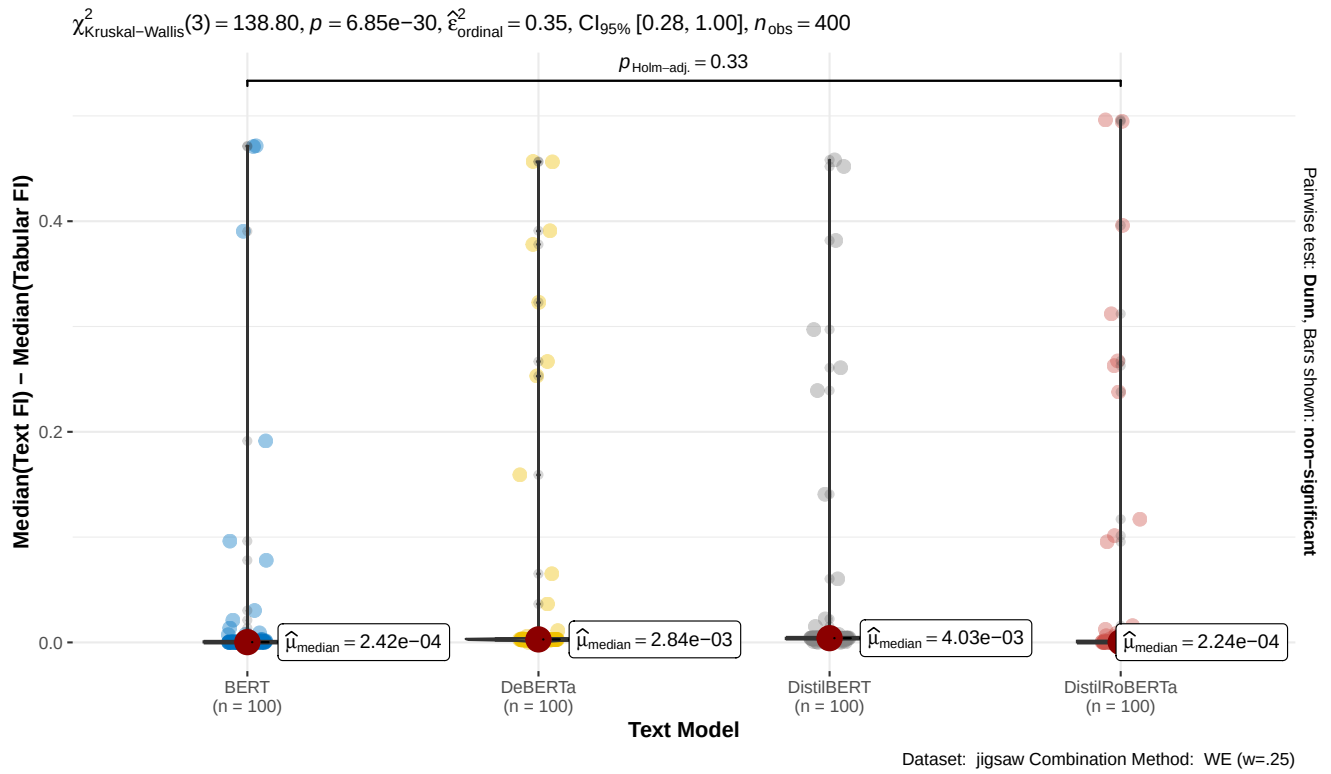


Figure 62. Median Text and Tabular Feature Importances Compared, by Text Model, on the *jigsaw* dataset with *Weighted-Ensemble* ($w=.25$) combination method

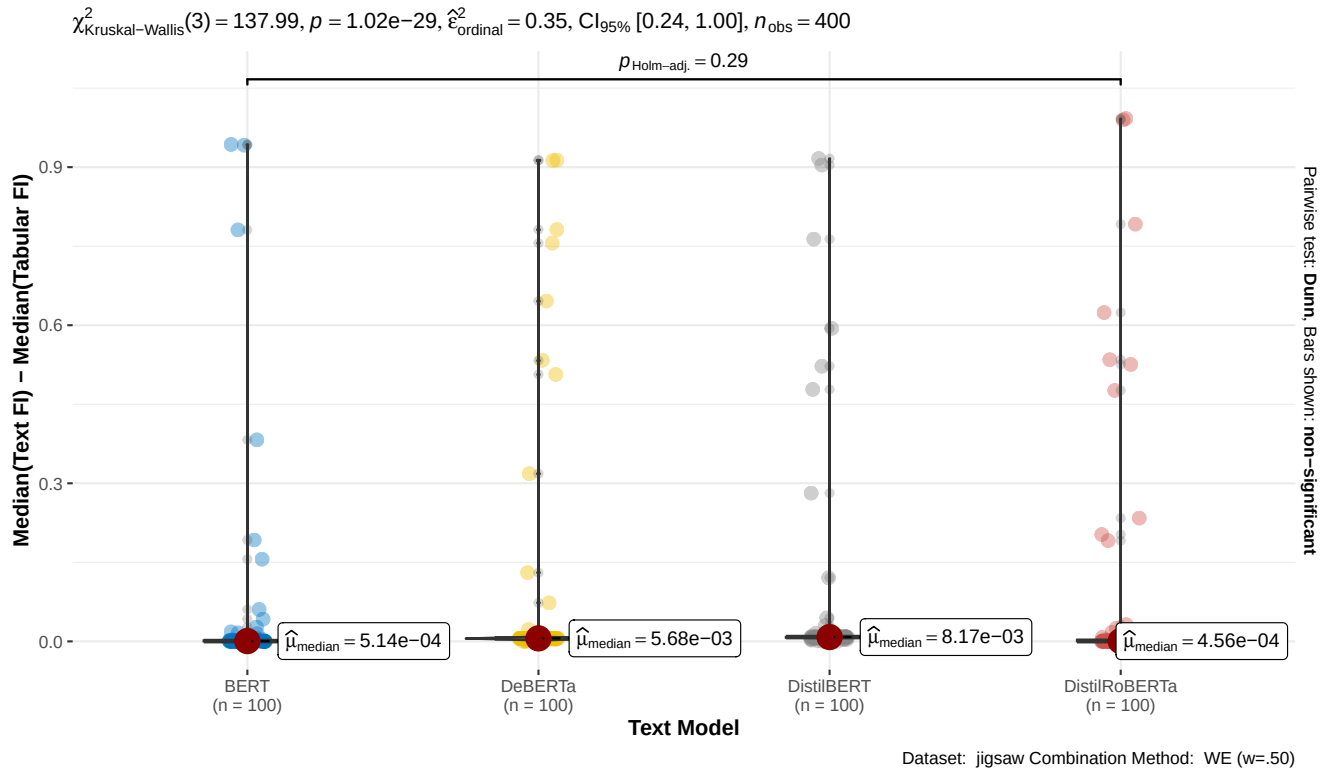


Figure 63. Median Text and Tabular Feature Importances Compared, by Text Model, on the *jigsaw* dataset with *Weighted-Ensemble* ($w=.50$) combination method

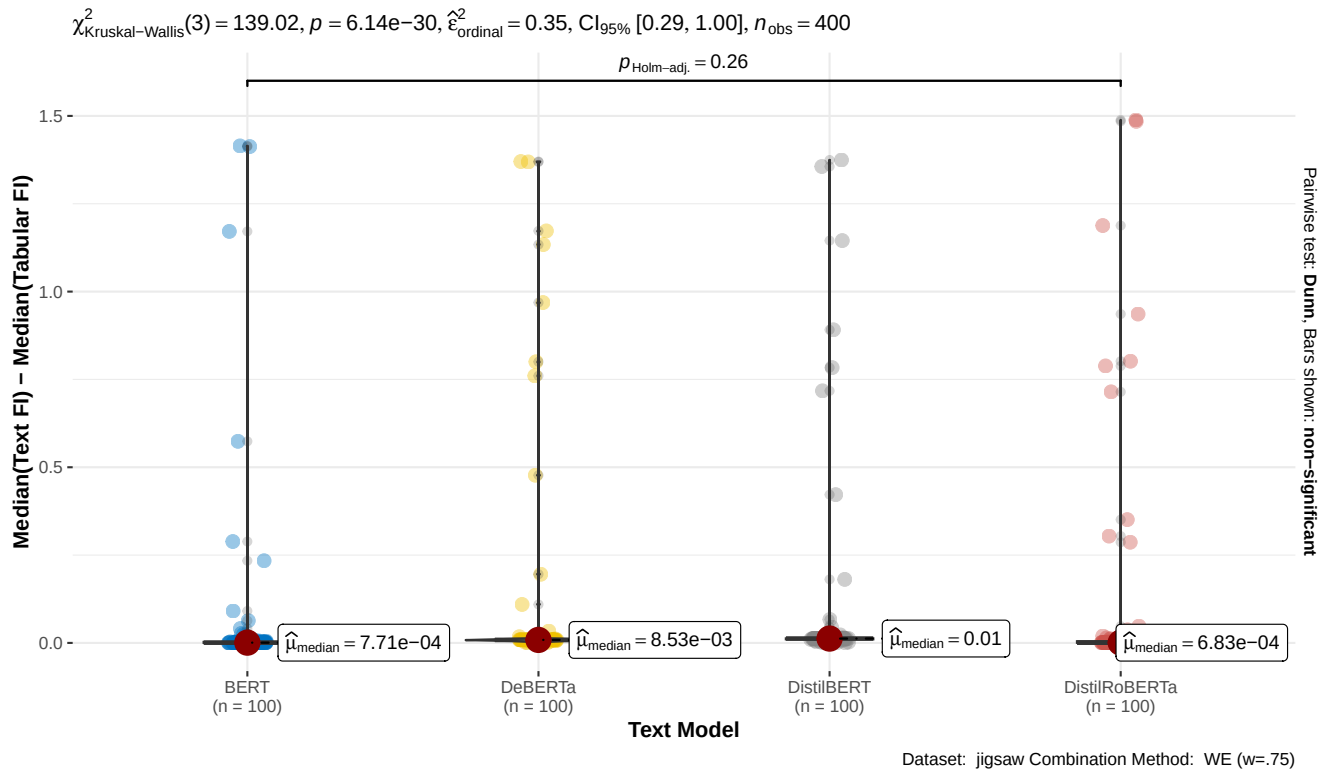


Figure 64. Median Text and Tabular Feature Importances Compared, by Text Model, on the *jigsaw* dataset with *Weighted-Ensemble* ($w=.75$) combination method

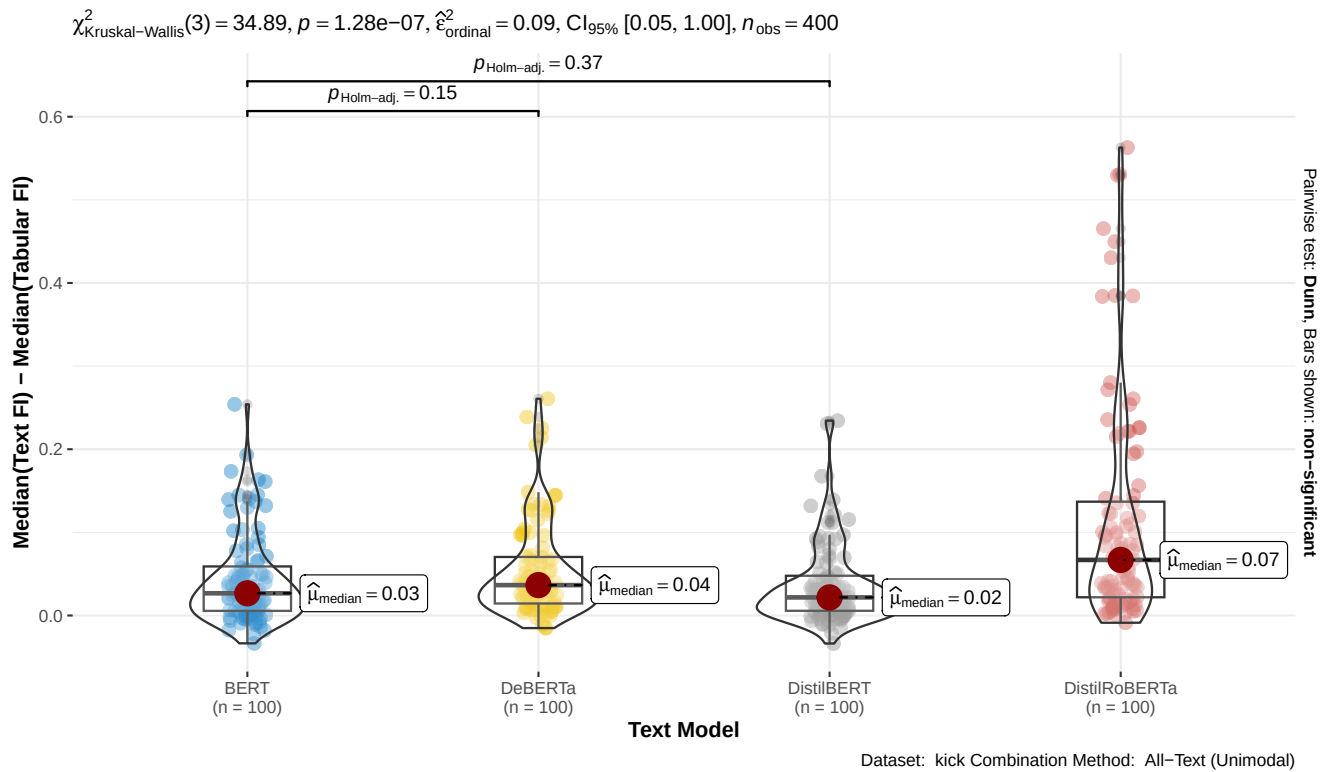


Figure 65. Median Text and Tabular Feature Importances Compared, by Text Model, on the *kick* dataset with *All-Text* (*Unimodal*) combination method.

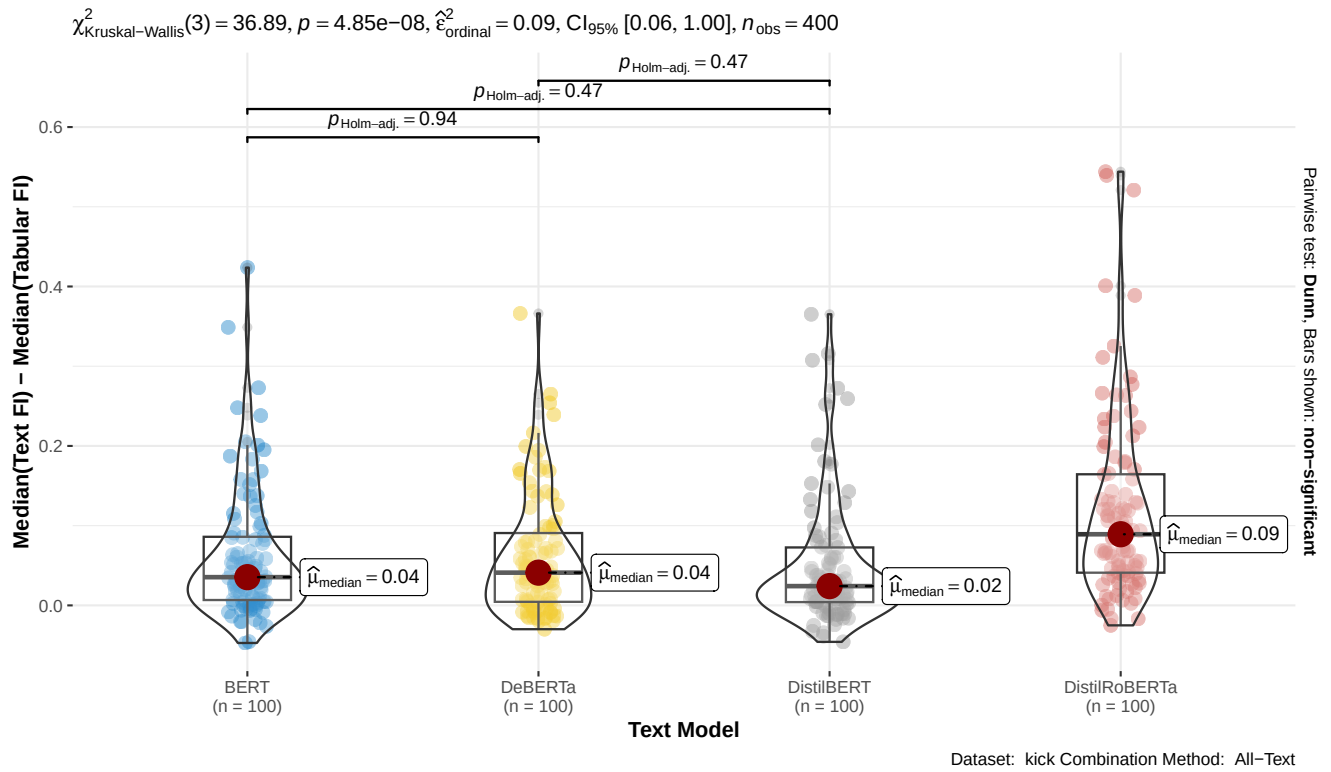


Figure 66. Median Text and Tabular Feature Importances Compared, by Text Model, on the *kick* dataset with *All-Text* combination method

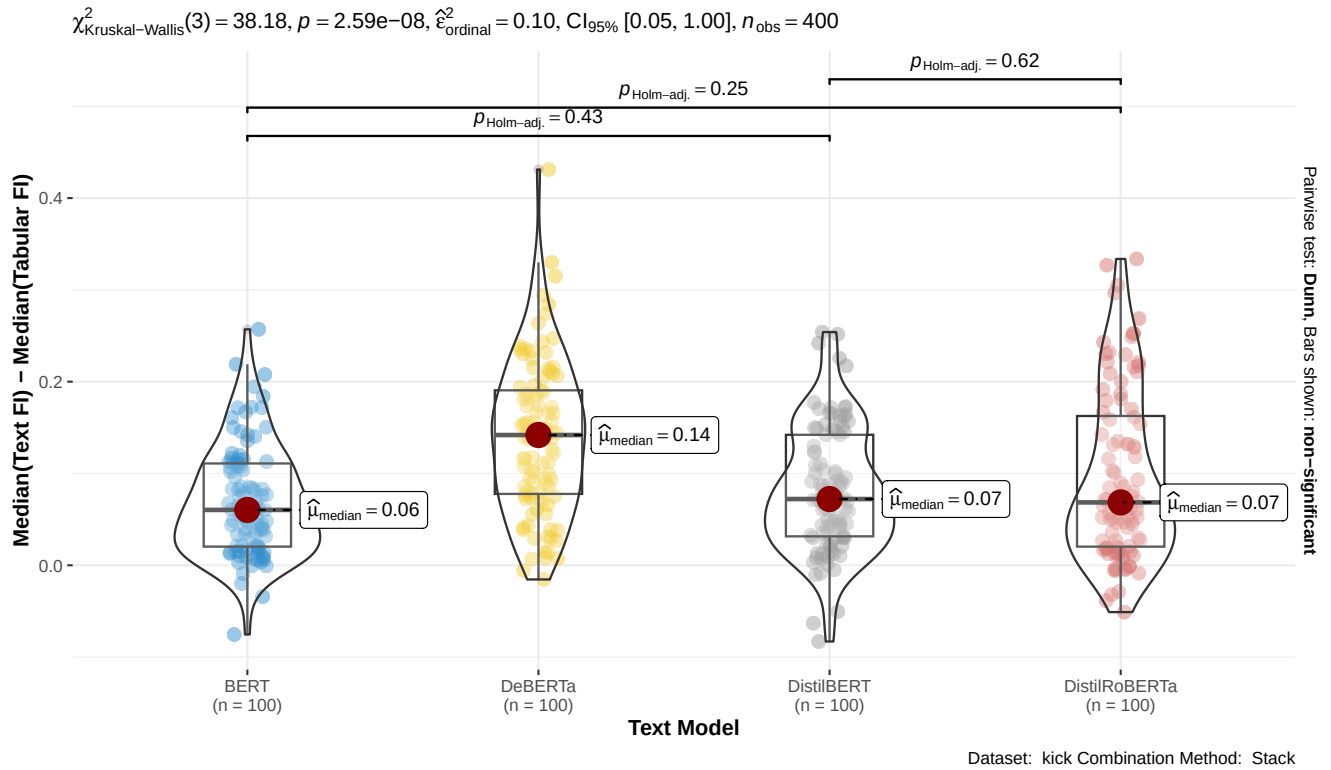


Figure 67. Median Text and Tabular Feature Importances Compared, by Text Model, on the *kick* dataset with *Stack* combination method

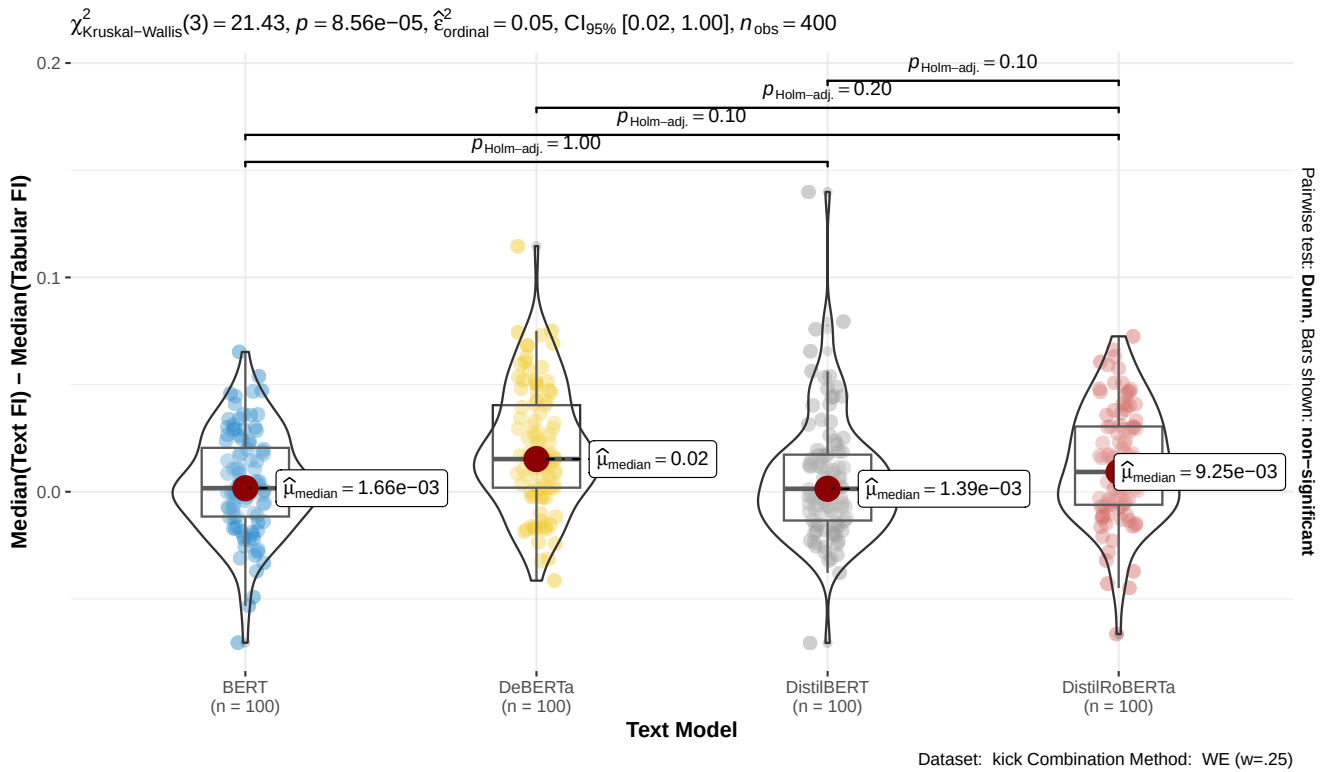


Figure 68. Median Text and Tabular Feature Importances Compared, by Text Model, on the *kick* dataset with *Weighted-Ensemble* ($w=.25$) combination method

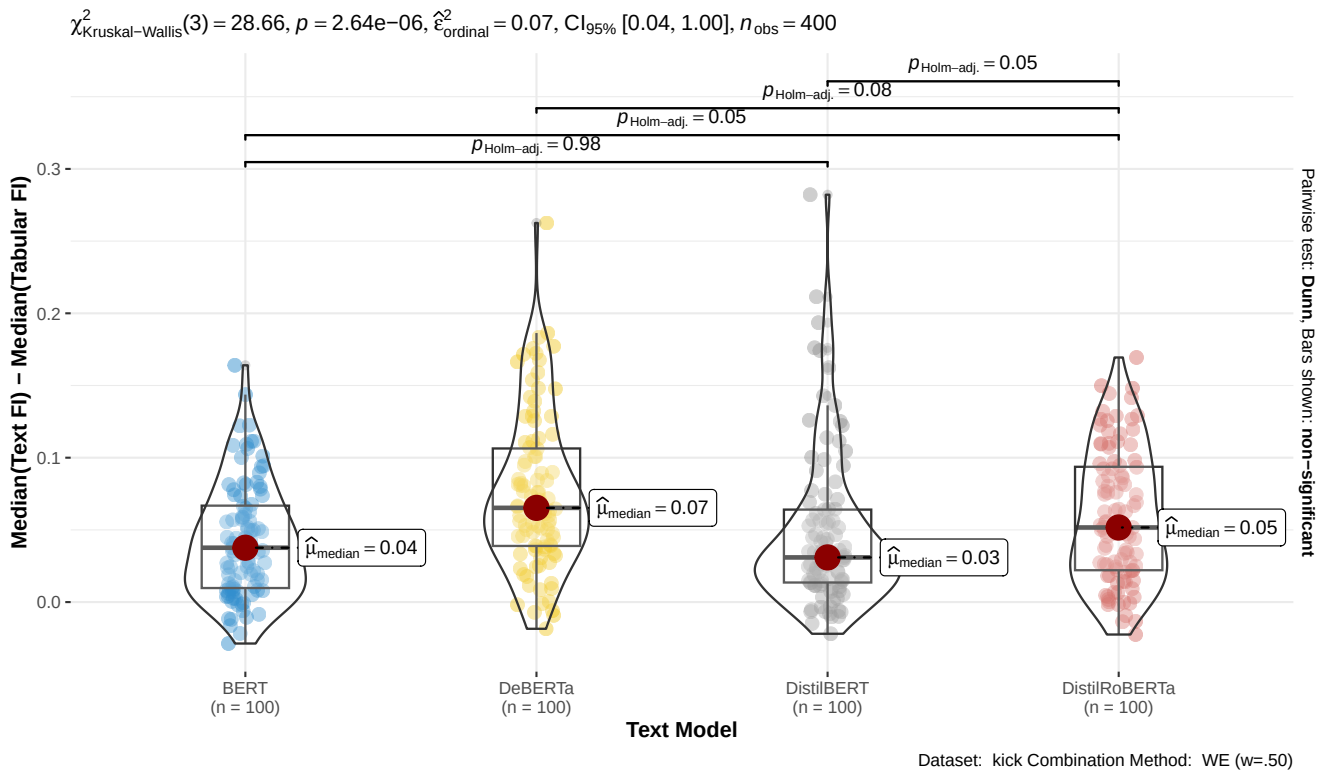


Figure 69. Median Text and Tabular Feature Importances Compared, by Text Model, on the *kick* dataset with *Weighted-Ensemble* ($w=.50$) combination method

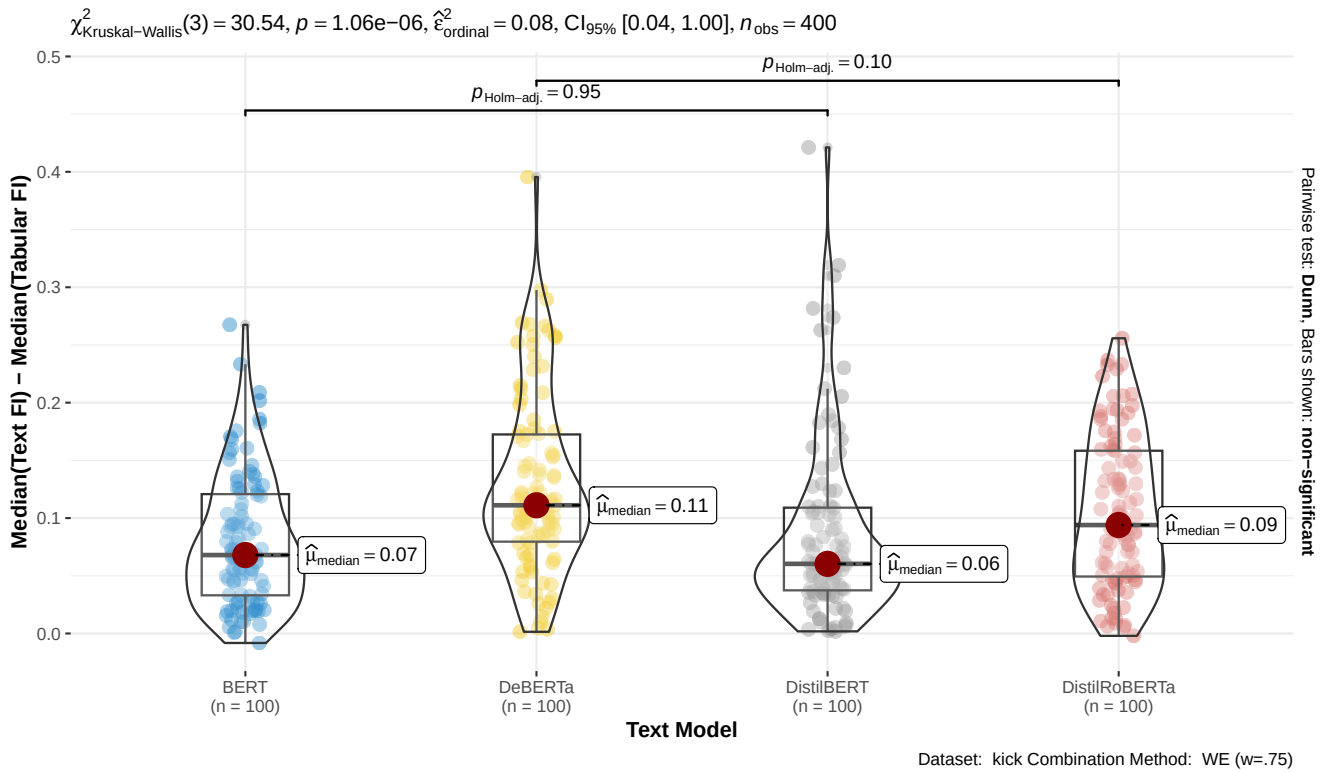


Figure 70. Median Text and Tabular Feature Importances Compared, by Text Model, on the *kick* dataset with *Weighted-Ensemble* ($w=.75$) combination method

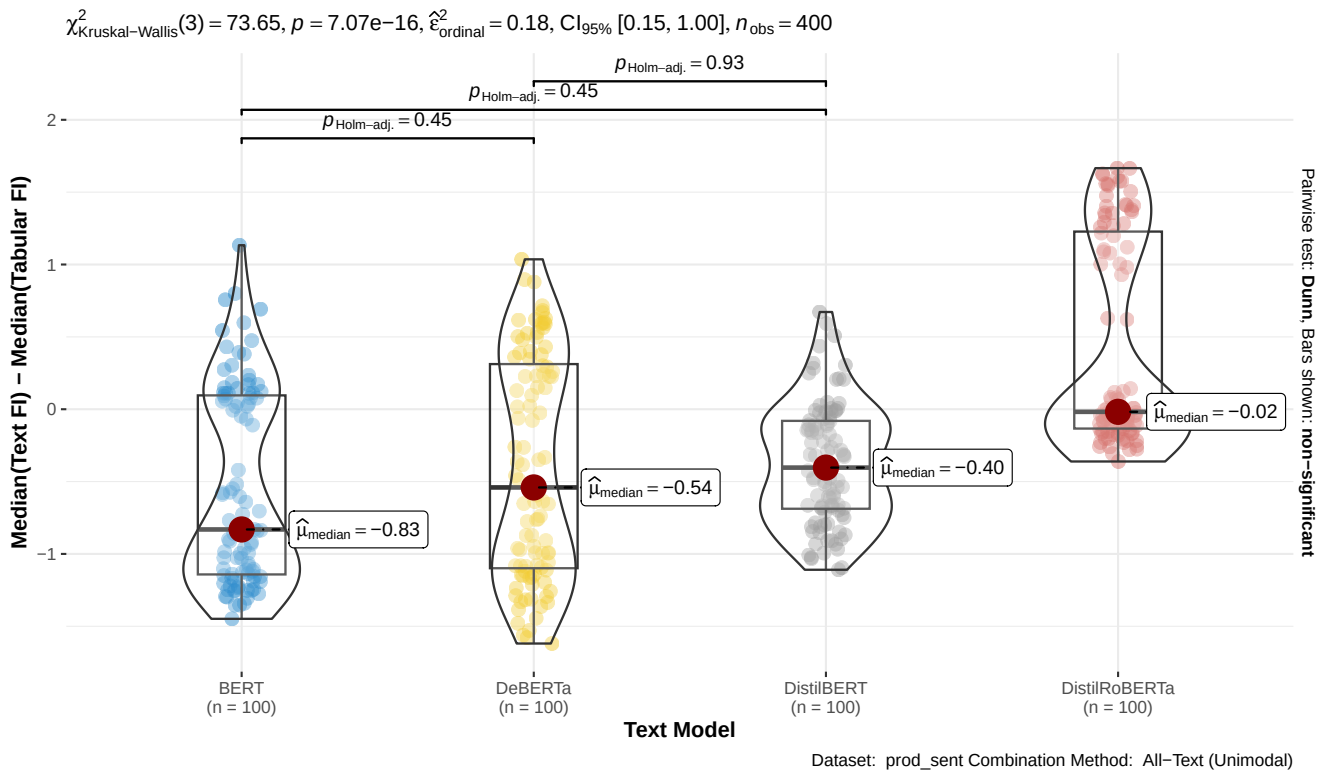


Figure 71. Median Text and Tabular Feature Importances Compared, by Text Model, on the *prod* dataset with *All-Text* (*Unimodal*) combination method.

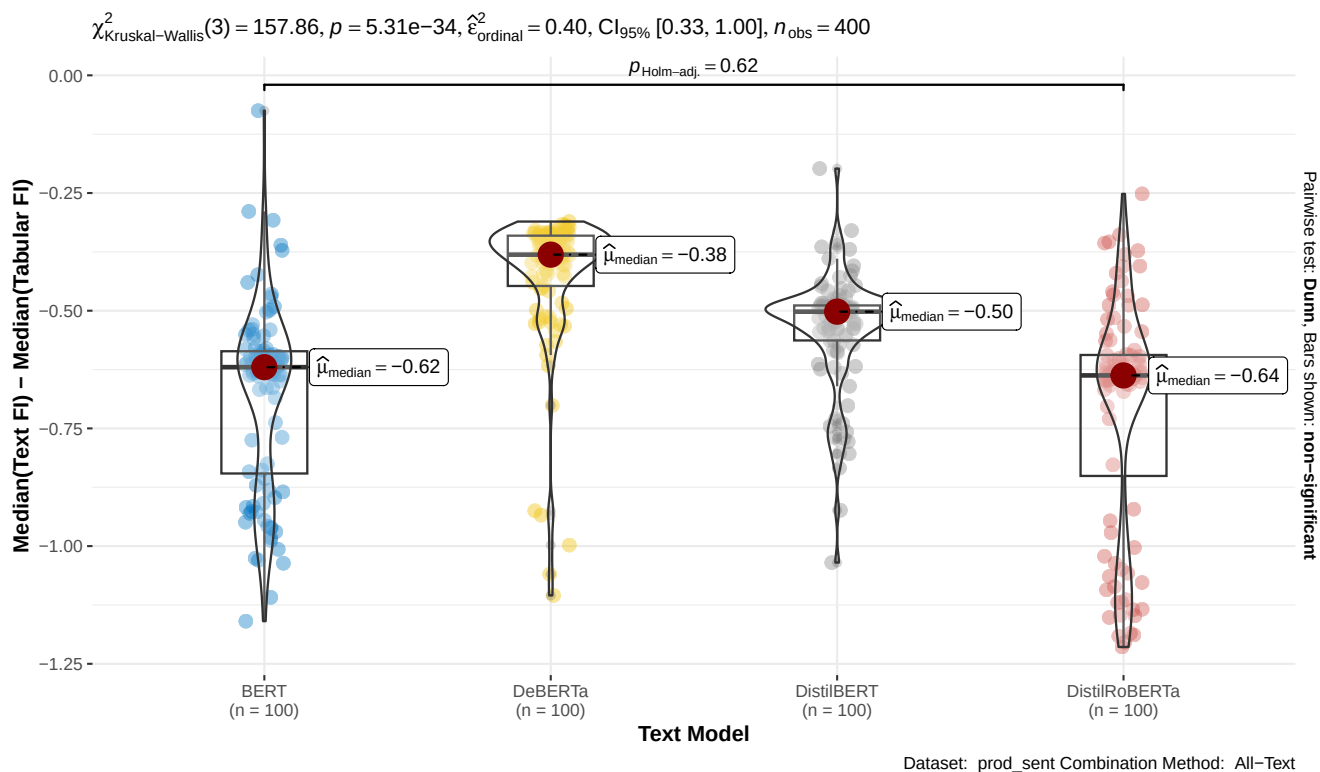


Figure 72. Median Text and Tabular Feature Importances Compared, by Text Model, on the *prod* dataset with *All-Text* combination method

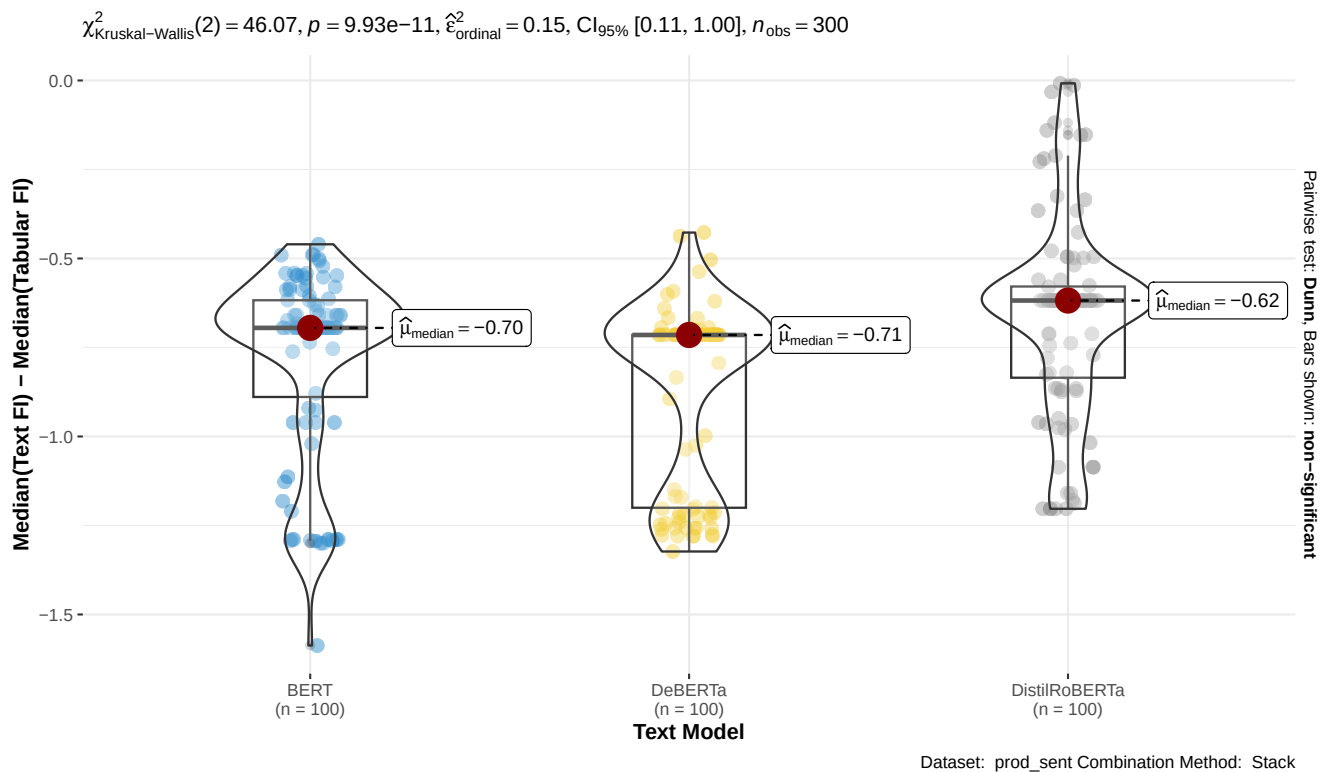


Figure 73. Median Text and Tabular Feature Importances Compared, by Text Model, on the *prod* dataset with *Stack* combination method

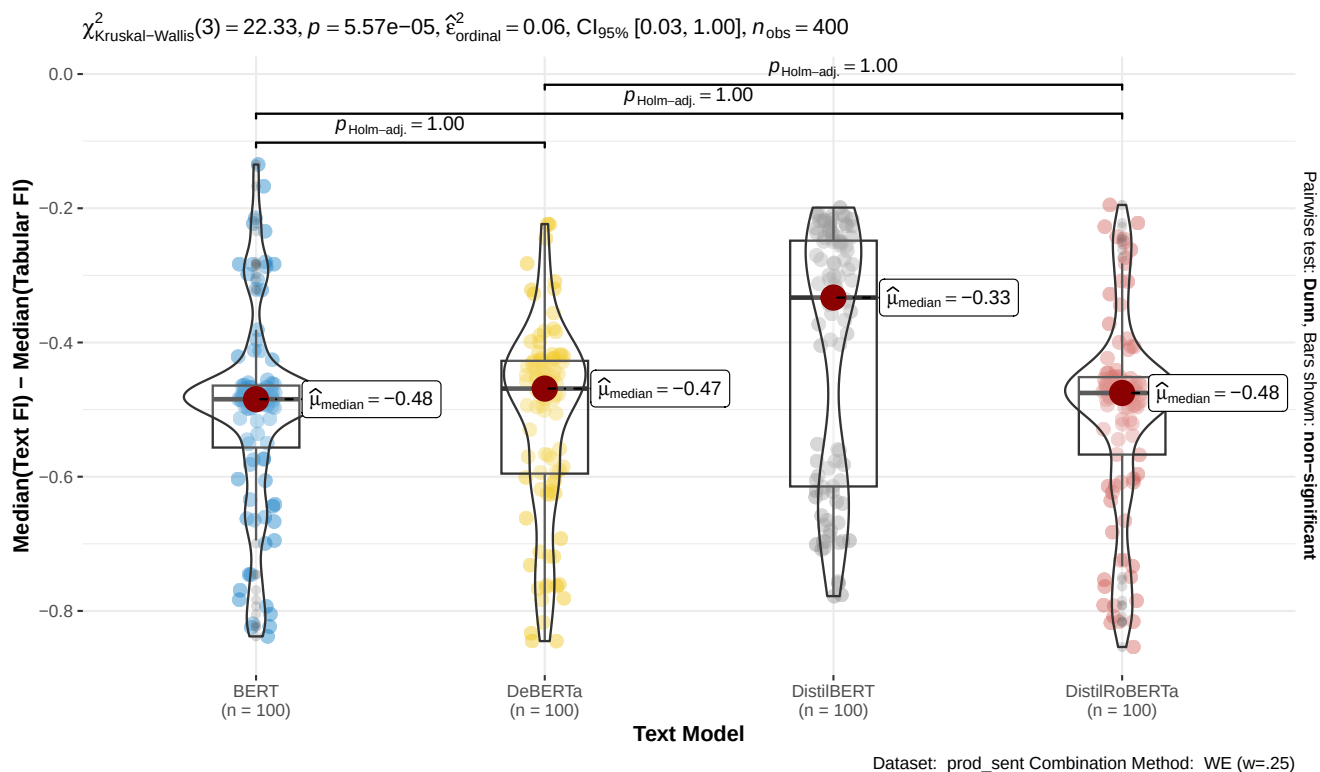


Figure 74. Median Text and Tabular Feature Importances Compared, by Text Model, on the *prod* dataset with *Weighted-Ensemble* ($w=.25$) combination method

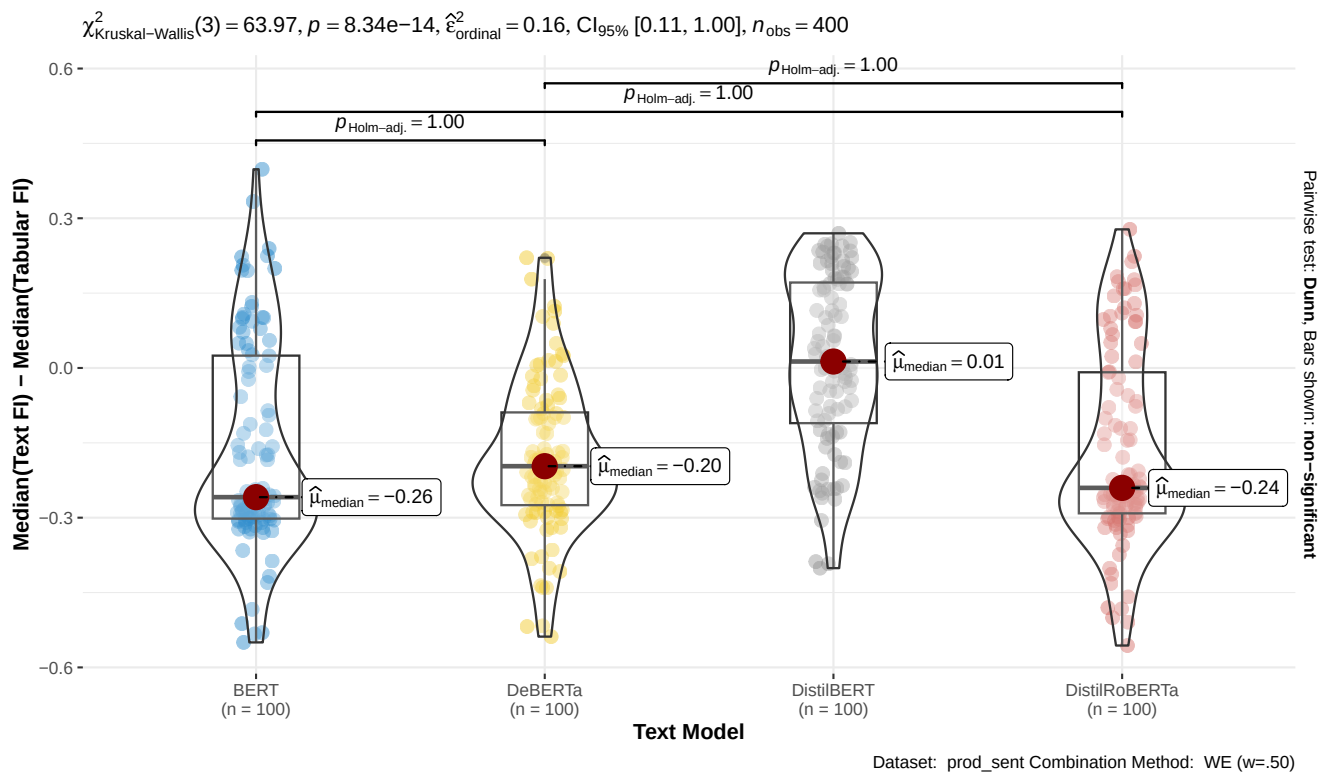


Figure 75. Median Text and Tabular Feature Importances Compared, by Text Model, on the *prod* dataset with *Weighted-Ensemble* ($w=.50$) combination method

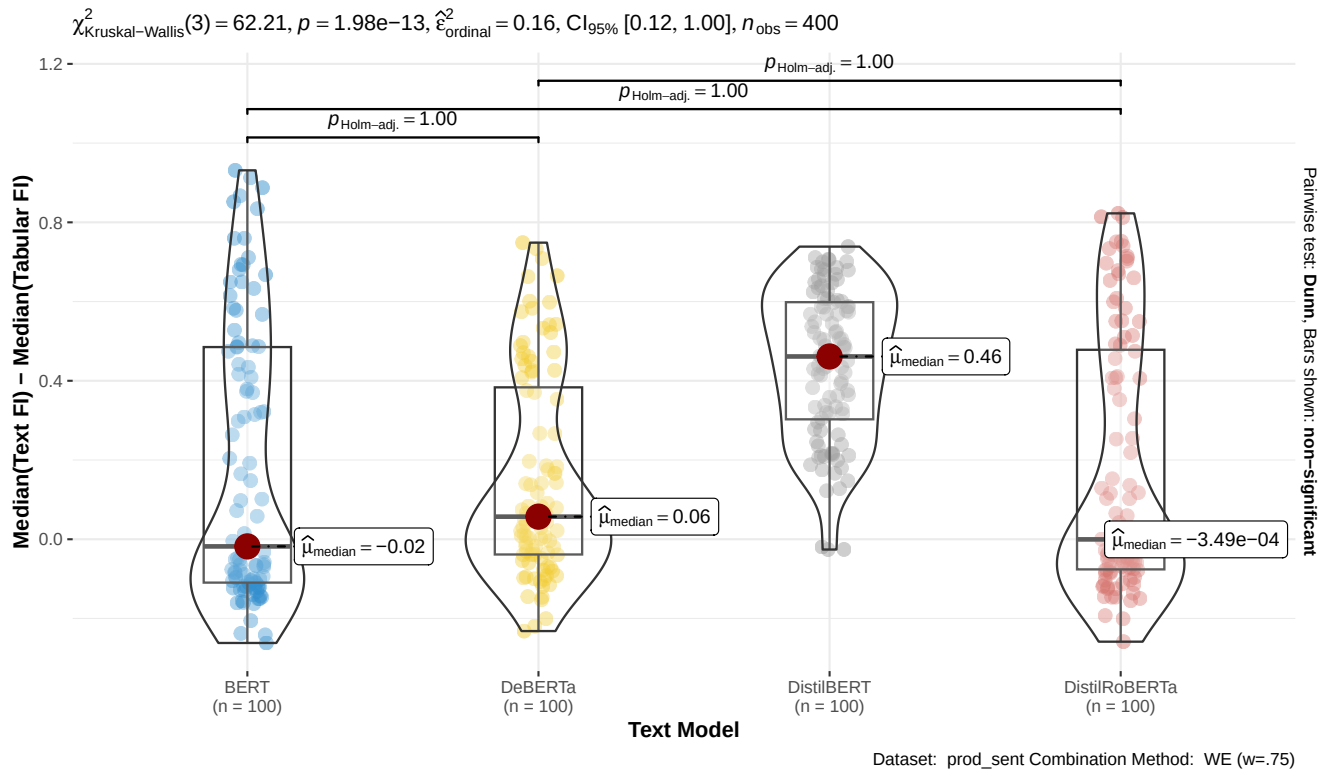


Figure 76. Median Text and Tabular Feature Importances Compared, by Text Model, on the *prod* dataset with *Weighted-Ensemble* ($w=.75$) combination method

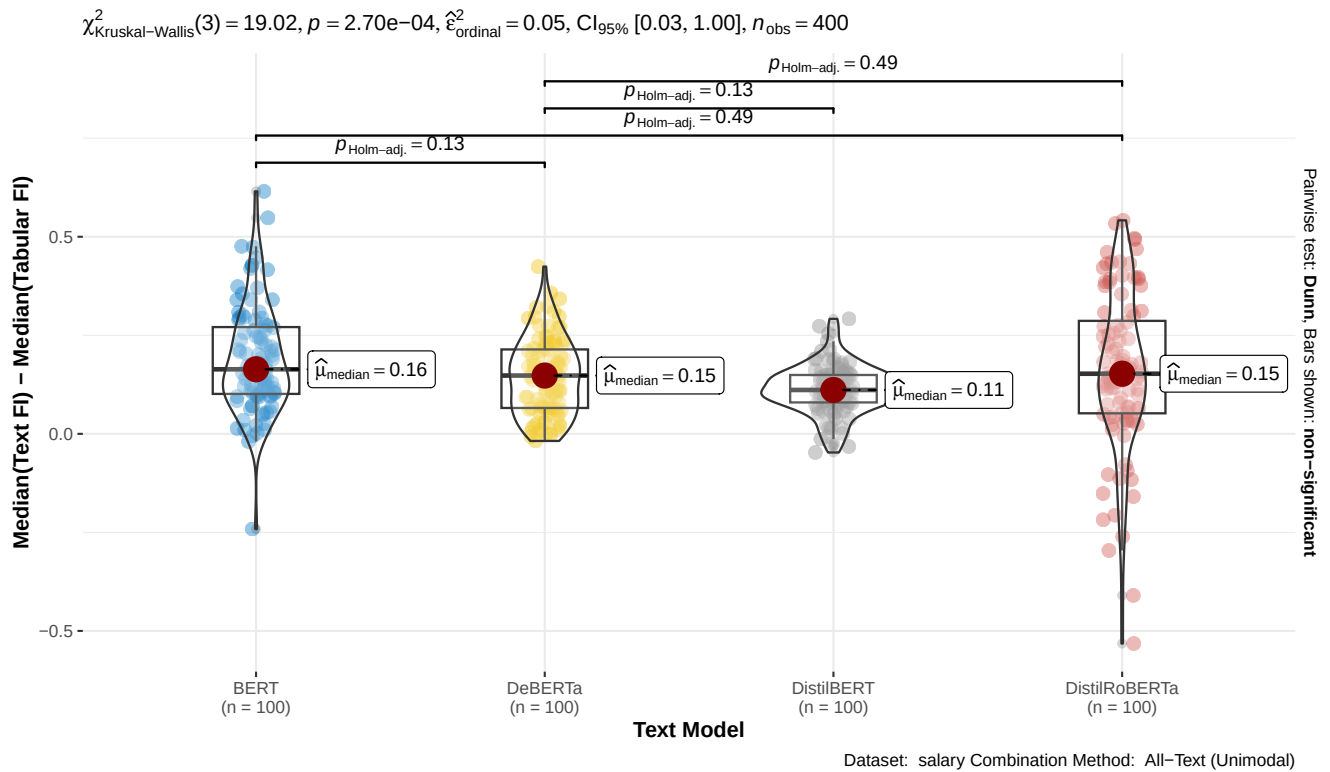


Figure 77. Median Text and Tabular Feature Importances Compared, by Text Model, on the *salary* dataset with *All-Text* (*Unimodal*) combination method.

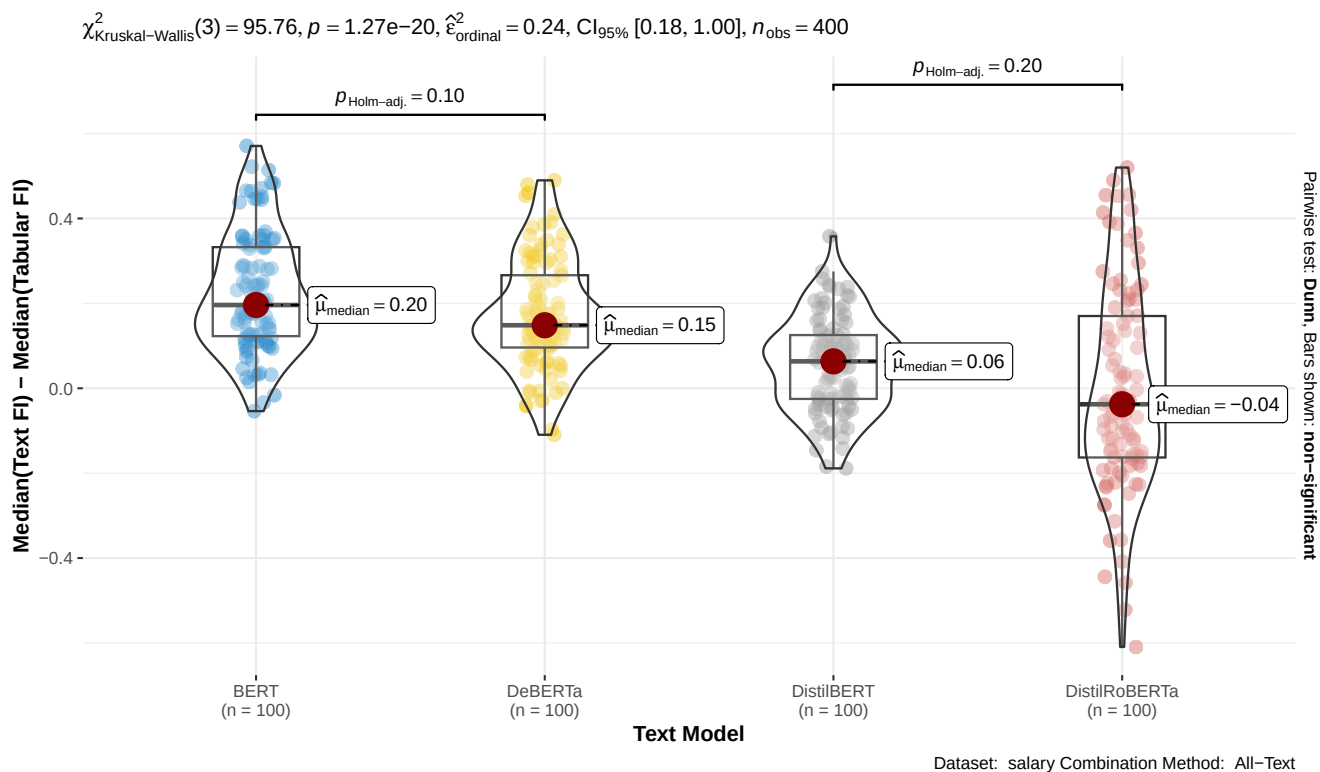


Figure 78. Median Text and Tabular Feature Importances Compared, by Text Model, on the *salary* dataset with *All-Text* combination method

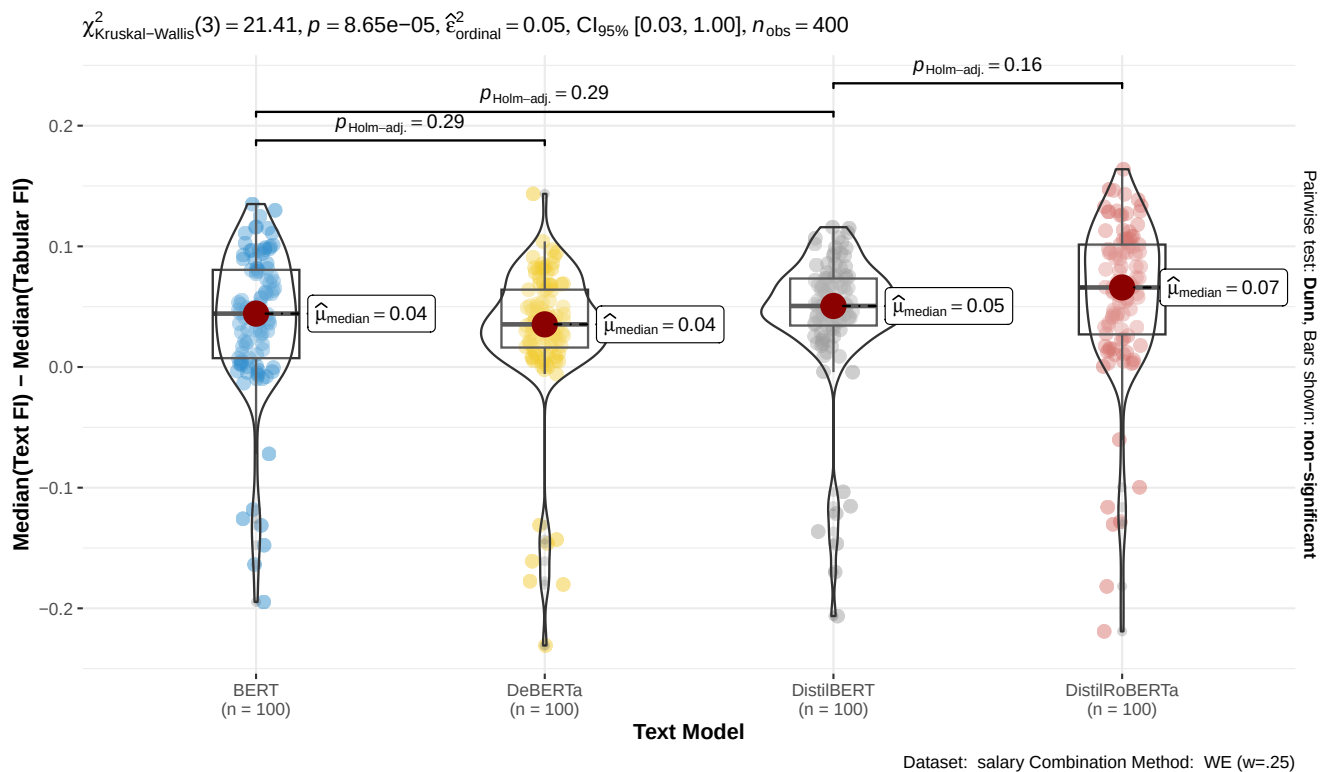


Figure 79. Median Text and Tabular Feature Importances Compared, by Text Model, on the *salary* dataset with *Weighted-Ensemble* ($w=.25$) combination method

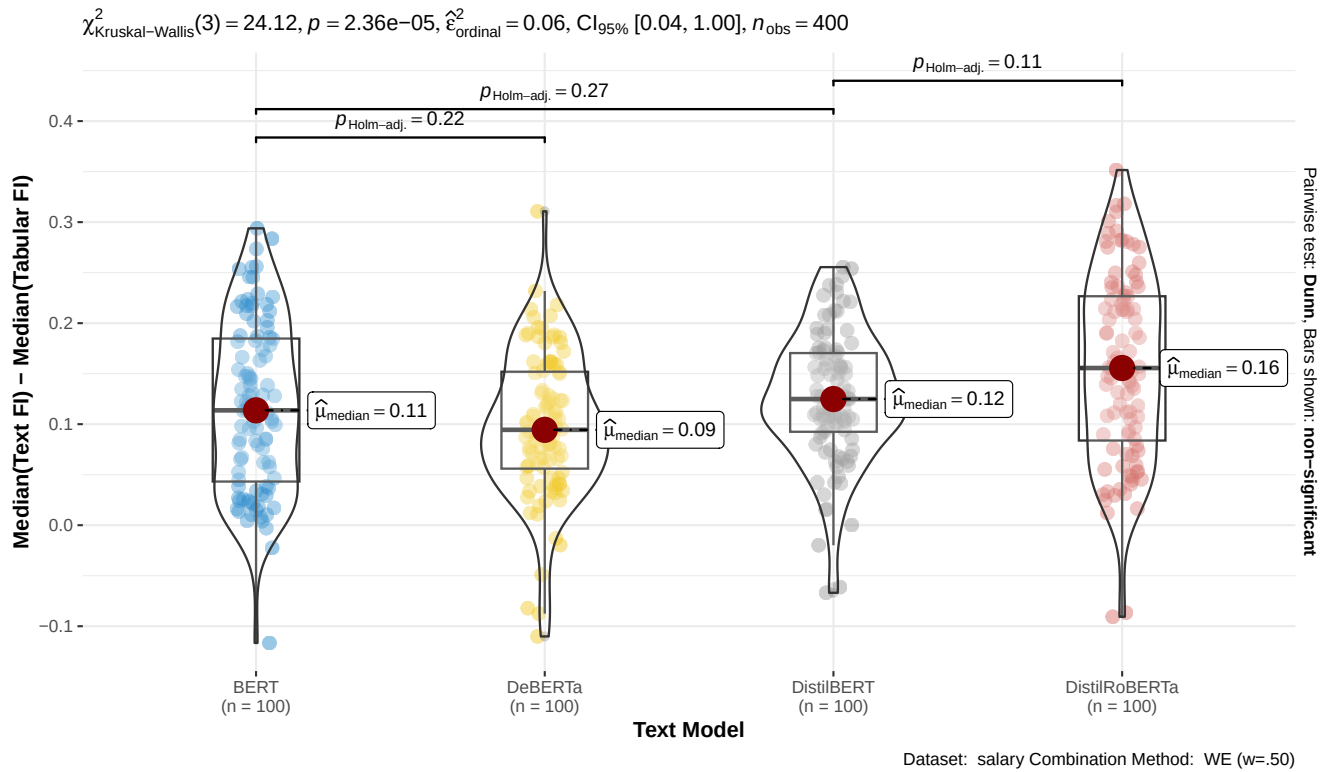


Figure 80. Median Text and Tabular Feature Importances Compared, by Text Model, on the *salary* dataset with *Weighted-Ensemble* ($w=.50$) combination method

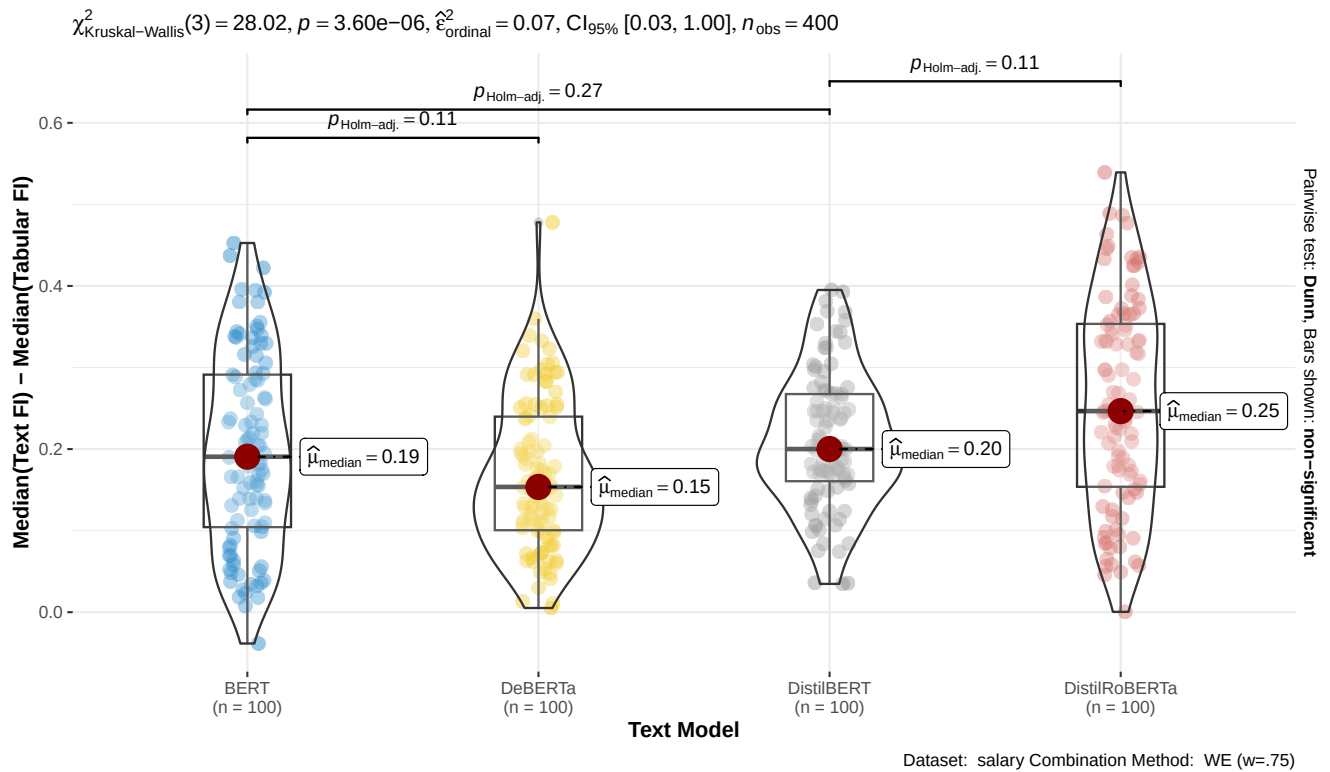


Figure 81. Median Text and Tabular Feature Importances Compared, by Text Model, on the *salary* dataset with *Weighted-Ensemble* ($w=.75$) combination method

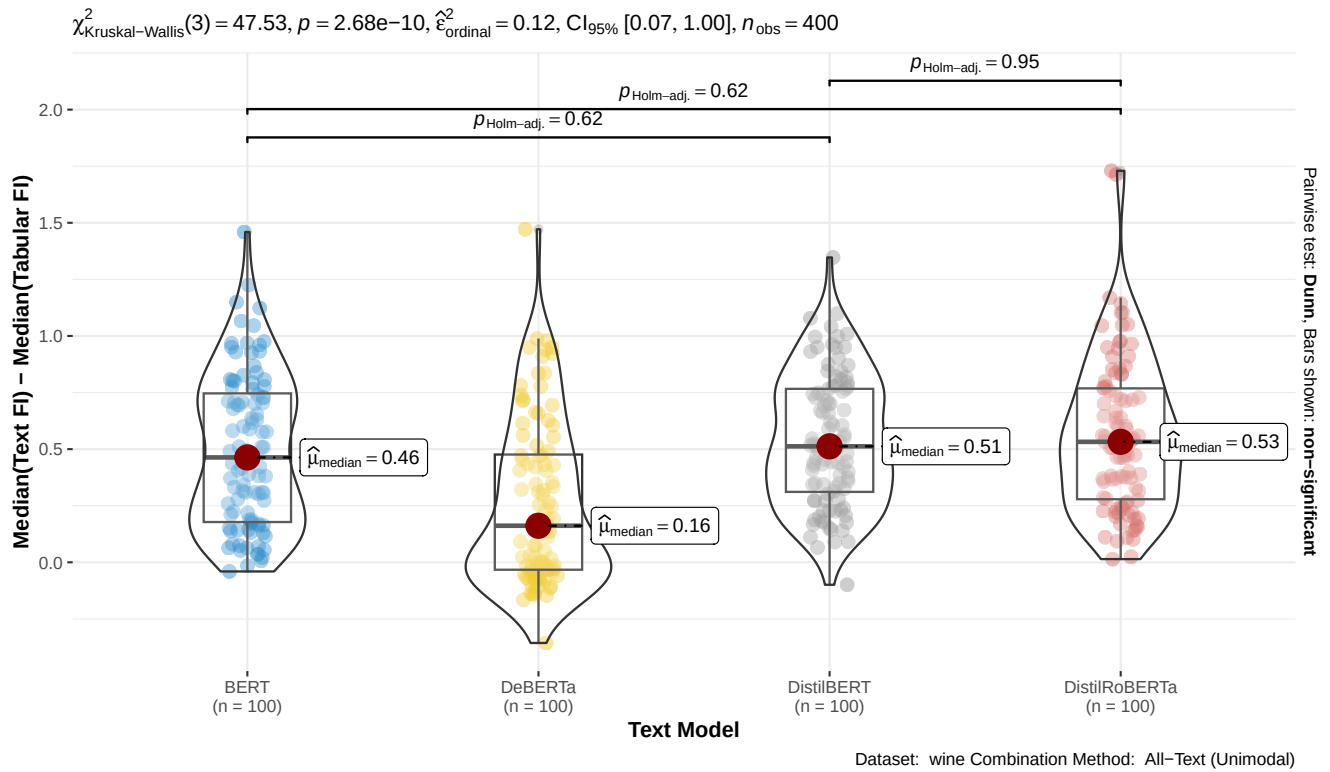


Figure 82. Median Text and Tabular Feature Importances Compared, by Text Model, on the *wine* dataset with *All-Text* (*Unimodal*) combination method.

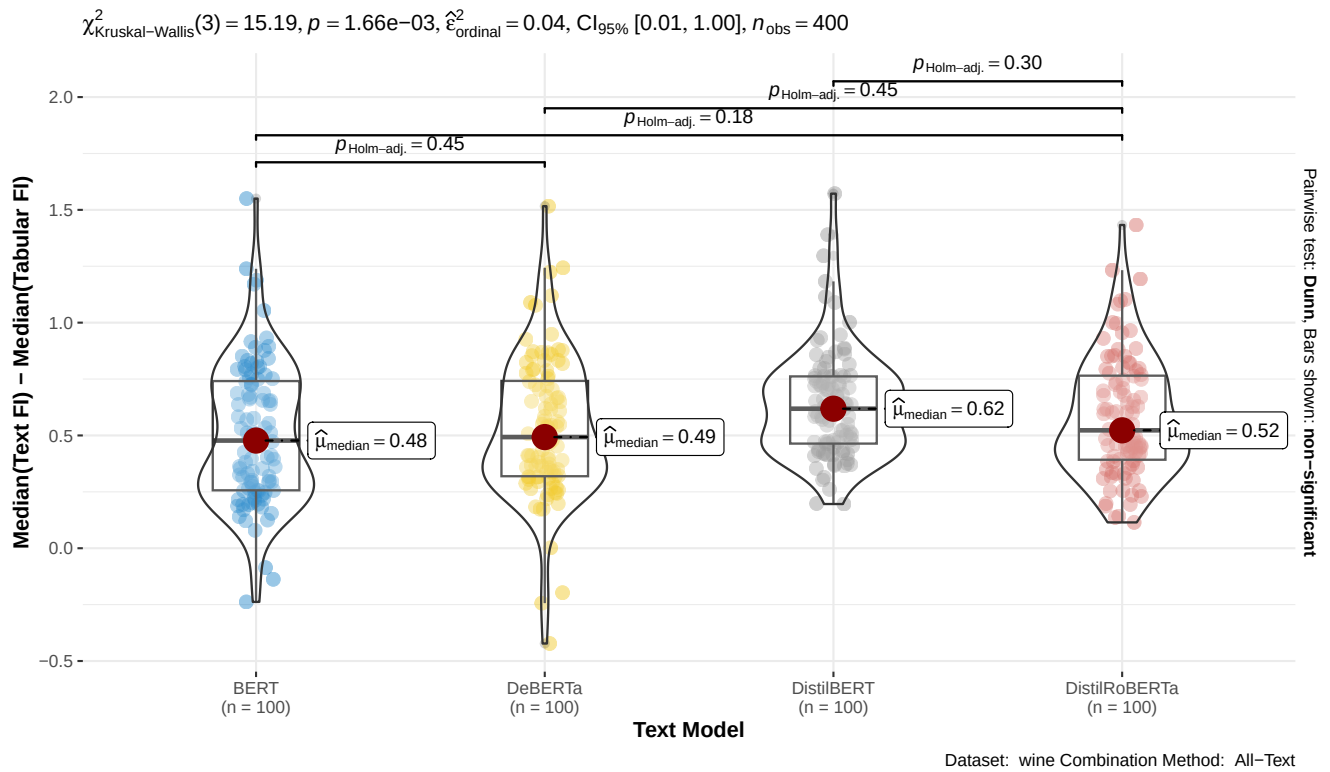


Figure 83. Median Text and Tabular Feature Importances Compared, by Text Model, on the *wine* dataset with *All-Text* combination method

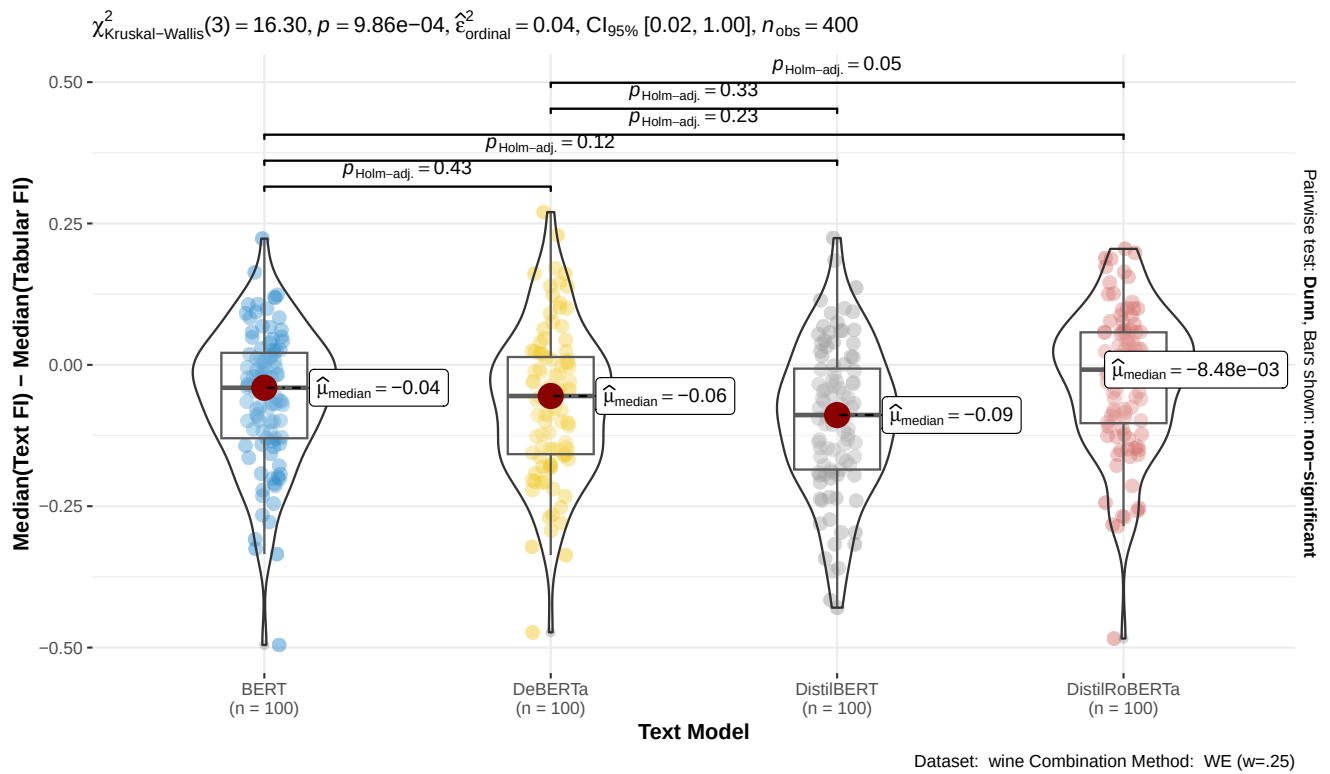


Figure 84. Median Text and Tabular Feature Importances Compared, by Text Model, on the *wine* dataset with *Weighted-Ensemble* ($w=.25$) combination method

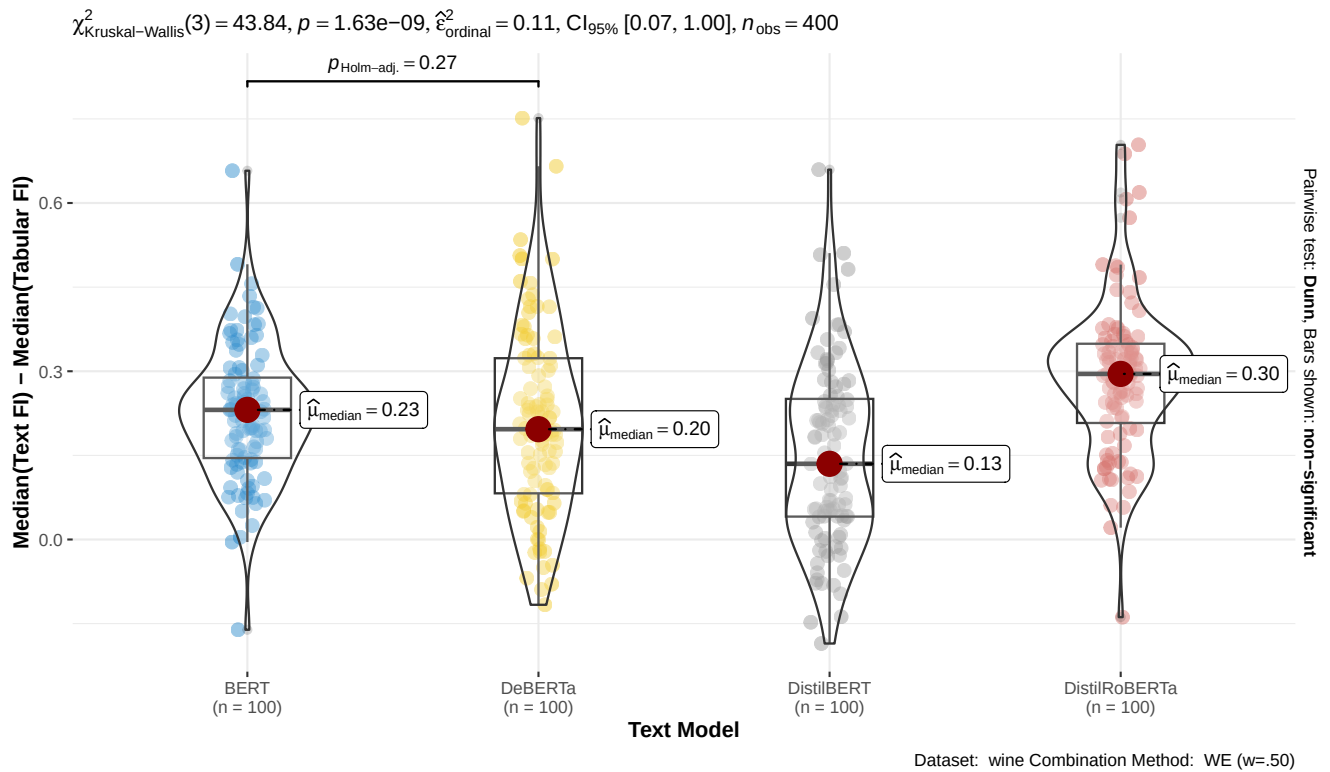


Figure 85. Median Text and Tabular Feature Importances Compared, by Text Model, on the *wine* dataset with *Weighted-Ensemble* ($w=.50$) combination method

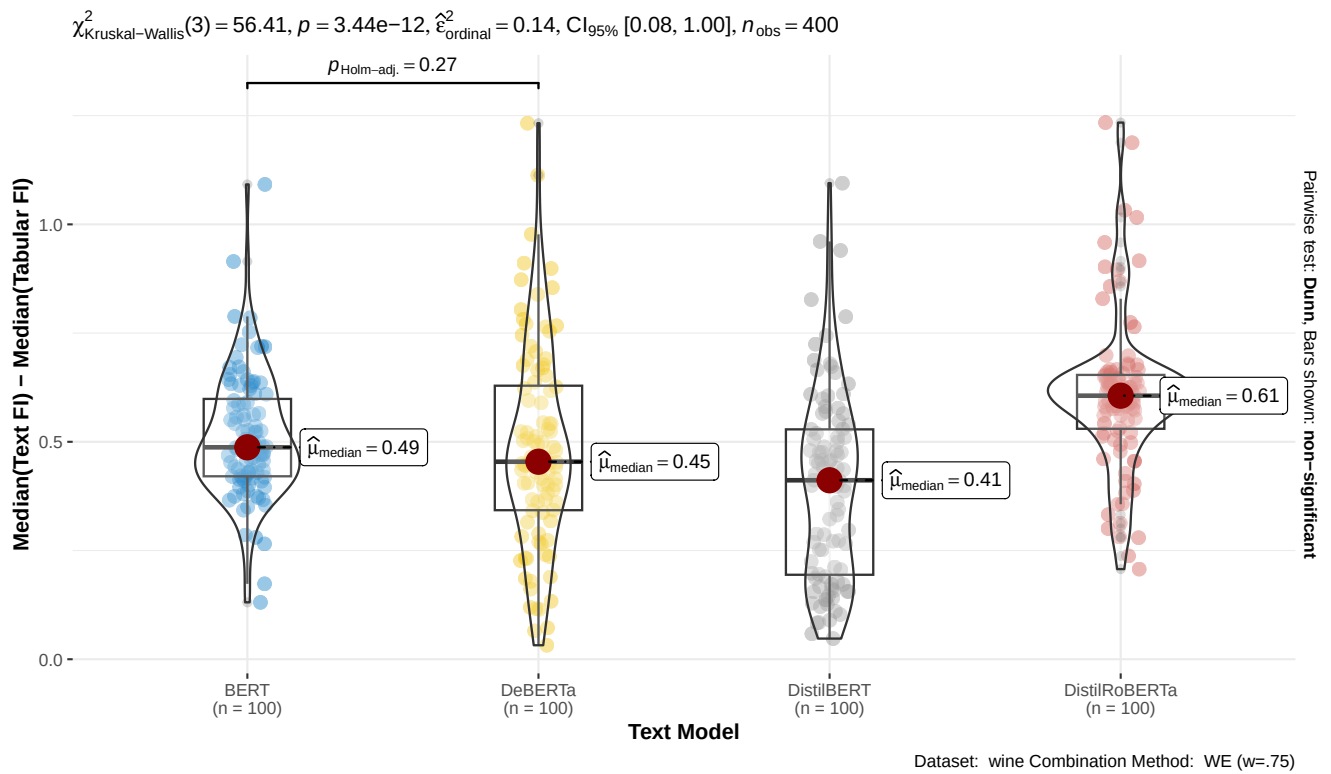


Figure 86. Median Text and Tabular Feature Importances Compared, by Text Model, on the *wine* dataset with *Weighted-Ensemble* ($w=.75$) combination method