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Character Evolution in The Lord of the Rings Trilogy: A Network, Sentiment, and Linguistic Analysis

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Significance

This study investigates how the main characters of The Lord of the Rings film trilogy evolve through their interactions, emotional trajectories, and linguistic patterns. Using tools such as social network analysis, sentiment analysis, and vocabulary modeling, we quantify changes in relationships, emotional tone, and language across the three films. Our central question asks how these interaction patterns, emotional shifts, and linguistic signatures reveal broader narrative structure, character roles, and underlying themes. Although applied here to a fictional universe, the analytical methods are widely used in scientific fields to study complex systems. This work illustrates how computational approaches can deepen our understanding of human narratives and cultural dynamics.

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Please provide details of author contributions here.

Please declare any competing interests here.

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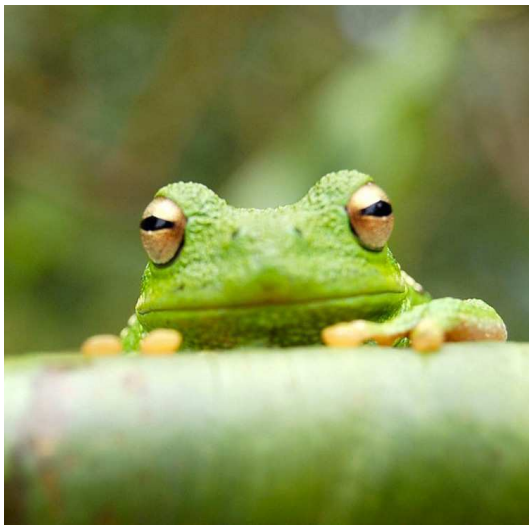

Fig. 1. Placeholder image of a frog with a long example legend to show justification setting.

Table 1. Comparison of the fitted potential energy surfaces and ab initio benchmark electronic energy calculations

Species	CBS	CV	G3
1. Acetaldehyde	0.0	0.0	0.0
2. Vinyl alcohol	9.1	9.6	13.5
3. Hydroxyethylidene	50.8	51.2	54.0

nomenclature for the TSs refers to the numbered species in the table.

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$$\begin{aligned}(x+y)^3 &= (x+y)(x+y)^2 \\ &= (x+y)(x^2+2xy+y^2) \\ &= x^3+3x^2y+3xy^3+x^3.\end{aligned} \quad [1]$$

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*Footnote Example 1

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Fig. 2. Placeholder image of a frog with a long example legend to show justification setting.

Table 2. Impact on Emission Behaviors by Socioeconomic Status

	(1)	(2)	(3)	(4)	(5)
	City-level		Firm-level	City-level	
Dep. Var.:	COD Emission (1,000 tons)		COD Emission (ton)	Firm Entry	Firm Exit
	Panel A: Population Share without College Education				
Share of Below College $\times$ Post_{05}	0.165***	0.292**	0.358***	0.623**	0.280
	(0.026)	(0.119)	(0.106)	(0.266)	(0.487)
Share of Below College	-0.208				
	(0.141)				
Post_{05}	-16.426***				
	(2.873)				
	Panel B: Population Share without High School Education				
Share of Below HS $\times$ Post_{05}	0.099***	0.218**	0.232**	0.453**	0.089
	(0.005)	(0.090)	(0.079)	(0.195)	(0.333)
Share of Below HS	-0.213*				
	(0.100)				
Post_{05}	-9.465***				
	(0.564)				

*** $\mathrm{P} < 0.01$, ** $\mathrm{P} < 0.05$, * $\mathrm{P} < 0.1$

Fig. 3. This legend would be placed at the side of the figure, rather than below it.

$$\begin{aligned}(x+y)^3 &= (x+y)(x+y)^2 \\ &= (x+y)(x^2+2xy+y^2) \\ &= x^3+3x^2y+3xy^3+x^3.\end{aligned} \quad [2]$$

Subsection for Method. Example text for subsection.

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