# Are randoms truly random?: Analyzing Linguistic Features of Keysmashes

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## 1. Introduction

"Keysmash" refers to seemingly random keystrokes generated by quickly moving fingers across a keyboard, often used and termed *random* by Turkish speakers for laughter or to convey strong emotions like excitement, anger or surprise, mainly in informal texts such as social media and chat rooms. Previous studies in the literature have stated that keysmashes have observable features that they share in common (McCulloch, 2019). Our study takes this observation one step further, arguing that keysmashes have an internal structure that is linguistically analyzable rather than being actually random. Through our analysis we identified medium-specific properties, demonstrating that keysmashes have internal structure and patterns.

## 2. Background & Our Observations on Keysmashes

Linguistically, keysmashes can be considered a part of written modality, produced using keyboards and fingers as articulators. We posit, based on two observations, that keysmashes cannot be truly random: the physical constraints of the articulators on its production, and the shared surface characteristics of keysmashes, distinguishing them from truly random computer-generated strings. A keysmash (1) and a randomly formed string (2) generated by a computer can be seen the examples provided below:

(1) skdkfkkdkdkfkvks (2) zldLoDvPagEXf

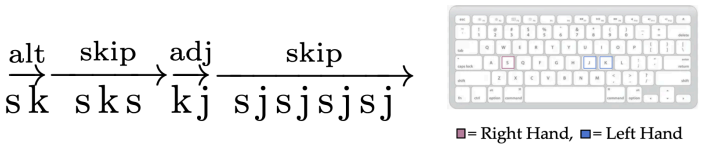
## 3. Our Hypothesis & Results

Through the analysis of keysmash strings within our dataset, we identified three predominant linguistic features that are fit to describe different forms of keysmashes: skip[1], alternation[2] and adjacency[3]. These features were pivotal in our exploration of the internal structures of keysmashes. As a precursor to our evaluation of the relevance of these features, we had developed a hybrid computational model for classifying keysmashes apart from random strings or natural language. This model was successful and served as a basis for our analysis of keysmashes employing both manual and computational techniques for notating the linguistic

[1] Skip(skip): Concerning patterns produced through alternating use of the same two letters.
[2] Alternation(alt): Relating to patterns created by alternating between different sections of the keyboard, utilizing both hands.
[3] Adjacency(adj): Concerning patterns generated through the use of adjacent keys on a keyboard.

features we propose. The model combined statistical-threshold based classification with n-gram analysis, n-grams were generated based on the movement from one key to another. Different forms of these movements served as the basis of our main proposal which is what we have defined as *features*.

(3)




Our hypothesis, which suggests keysmashes have an inherent structure, indicated by our model's success, led us to analyze these features more methodically. The formulation of these features included considerations of keyboard layout, adjacency of the specific keys within it, and dividing these layouts to accommodate alternations between hands. By establishing formulaic thresholds and examining the prevalence of features across every bigram within a keysmash, we demonstrated a statistically significant difference between the structure of keysmashes to that of both computer generated random strings and natural language. We posit that, contrary to keysmashes' perceived randomness, they exhibit linguistically analyzable structures and patterns, suggesting a mental grammar present in both perception and production of its users.

## 4. Discussion & Ideas for Future Research

We propose that keysmashes can be further studied within a psycholinguistic framework. We observed that keysmashes elicit varying responses from speakers based on how their features are utilized, with those not conforming to certain criteria of organization and feature presence being deemed "unacceptable." Conducting psycholinguistic experiments to investigate what constitutes grammatical acceptability for keysmashes could allow for a deeper understanding of their internal organization and grammatical structure. The inherent properties of these features and their interaction mechanics appear to show strong correlations with the constraints of the medium of production. These constraints, by influencing the distribution of features within keysmashes, play a crucial role in shaping speakers' perceptions of acceptability. We suggest future research to formalize these observations by analyzing the interaction of these variables. By examining and describing the core properties and interactions of keysmashes at various levels, we aimed to provide a foundational basis for linguistically analyzing keysmashes.

**References** McCulloch, Gretchen. *Because Internet: Understanding the New Rules of Language*. Penguin, 2019.