User Perceptions of Five-Word Passwords

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A ARTIFACT APPENDIX

A.1 Abstract

In our paper we explore a specific passphrase selection strategy called five-word passwords, where users are assigned five random words to form the basis of a passphrase. We first surveyed $n = 150$ participants where each was assigned to three different treatments with different five-word password generation methods. After two weeks $n = 116$ participants came back for a second part where they were asked to recall the five-word password and some questions about this format of passphrase. In this artifact, we provide (1) survey code for both parts of the survey; (2) docker images used to handle both front and back ends of the survey; (3) List of $1,630$ words we used as a dictionary for generating five-word passwords; (4) responses from participants from both survey; (5) coodbook used to encode participants' response to free text questions; (6) jupyter files used for graph creation.

A.2 Artifact check-list

- **Data set:** Provided in the survey-data folder of the Github repository.
- **Run-time environment:** Docker, Jupyter Notebook (recreate graphs used for the paper).
- **Hardware:** A functional PC, Mac or Linux machine.
- **Disk space (approximately)?:** 200MB
- **How much time is needed to prepare workflow (approximately)?:** Depending on whether the required environment (Docker and Jupyter Notebook) and required packages are pre-installed. If none of the above are install, the setup should take around an hour.
- **How much time is needed to complete experiments (approximately)?:** Once the environment is set up, the approximate time to complete both survey should take less than 20 minutes.
- **Archived:** https://github.com/gwusec/2022-ACSAC-Five-word-Passwords

A.3 Data Collected

https://github.com/gwusec/2022-ACSAC-Five-word-Passwords/survey-data/README.md

A.4 Installation

https://github.com/gwusec/2022-ACSAC-Five-word-Passwords/survey/README.md

A.5 Experiment Workflow

We performed this study with a two-part survey. Data were collected from the survey and we used qualitative coding to analyze participants' response to free-response questions. Jupyter notebooks were used to quantitatively analyze participants' quantitative response and five-word passwords collected from the survey. Both codebook and jupyter notebooks are provided alongside raw data of survey response.

A.6 Coodbook

- **secure (131)**
  hard-guess (16), hard-crack (13), length (10), random (6), unique (6), no-personal (5), not-confident (4), not-enough (4), dots (3), uncommon (2), word-choice (2), no-sense (1), infinit-combo (1), special (1), not-remember (1), only-words (1), prefer-password-manager (1)
- **words-and-chars (125)**
  random (44), personal (30), pet-name (6), easy-to-remember (5), sentence (1), movie (1), favorite (1), anime (1), object (1)
- **easy-to-remember (125)**
  words (9), sentence (7), short (7), humor (4), rythmic (4), theme (4), rhythm (3), story (3), strong (2), word-ordering (2), first-letter (2), frequently-use (2), relatable (1), spelling (1), coherent (1), common-words (1), first-combo (1), secure (1), relate-to-words (1), typo (1), one-syllable (1)
- **no-change (109)**
- **combination (93)**
  nums-letters-symbols (25), nums-words-symbols (11), words (9), nums-words (8), personal (7), nums-letters (6), letters-symbols (3), words-symbols (2), letters (2), object-inspiration (1), nums-symbols (1)
- **numbers (60)**
  personal (11)
- **add (57)**
  symbols (28), numbers (18), nums (17), capitals (14), caps (8), special-chars (6), characters (2), acronym (1), punctuation (1), words (1), similar-words (1), favorite-movie-char (1)
- **repeat (53)**
  in-head (22), oral (13), visual (4)
- **words (40)**
  personal (13), work (11), favorite-words (4), company-name (4), random (3), usual-pass (1), company-name-+-CEO-name (1), review (1), last-two (1)
- **same (37)**
  variation (18), change-regularly (1), change-monthly (1)
- **hard-to-remember (36)**
- **not-secure (35)**
  easy-crack (10), only-words (9), add-symbols (5), easy-guess (5), add-nums (5), add-caps (2), breach (1), hack (1), better-than-normal (1), short (1), personal (1), hard-crack (1)
- **memory (32)**
- **usual-pass (31)**
- **write-down (24)**
  photo (2), store (1)
- **no-method (24)**
- **n/a (22)**
- **bad-memory (21)**

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- **physical-storage (21)**
- **password-manager (39)**
- **variation (18)**
  usual-pass (14), change-quarterly (1), object-inspiration (1), change-monthly (1)
- **change (18)**
  length (7), words (5), entire-pass (2), first-word (1), into-sentence (1), style (1), word-odd (1), structure (1)
- **unique (17)**
- **browser-storage (16)**
- **surroundings (15)**
- **change-words (14)**
  memorable (3), sentence (2), complex (2), personal (2), no-personal (1), monosyllable (1)
- **sentence (13)**
- **passwordbank (12)**
  variation (2)
- **change-length (12)**
  reduce (7), increase (1)
- **must-use-everyday (9)**
- **acronyms (9)**
- **file-storage (9)**
- **make-easy-to-remember (9)**
- **good-memory (9)**
- **object-inspiration (9)**
  work (6), personal (1), favorite (1)
- **secure-for-some (9)**
- **long (8)**
- **remember-few (8)**
- **hard-to-guess (8)**
- **favorite (7)**
  sayings (1)
- **remove (7)**
  periods (5), words (1), all-s (1)
- **within-dictionary (6)**
  short-words (1)
- **imagination (6)**
- **meanings (6)**
- **nums (6)**
  work (3), personal (2), personal-+-work (1)
- **use-only-one (6)**
- **use-pass-manager (6)**
- **things-on-mind (5)**
- **passwordbank-2 (5)**
  categorized (1)
- **story (5)**
- **change-dots (4)**
- **needs-personal-meaning (4)**
- **personal (4)**
- **device (4)**
  mnemonic (3)
- **passwordbank-3 (4)**
- **get-used-to (4)**
- **random (4)**
- **common (4)**
- **formula (4)**
- **make-familiar (3)**

- **passwordbank-5 (3)**
- **order-matters (3)**
- **phrase (3)**
- **use-method (3)**
- **first-combo (3)**
- **different-format (2)**
- **context (2)**
  meaningful (2)
- **do-not-want-use (2)**
- **better-than-other (2)**
  short (1)
- **accident (2)**
- **next-word (2)**
  secure (1)
- **theme (2)**
- **work-related (2)**
- **not-five (2)**
- **randomly (2)**
  story (1)
- **feelings (2)**
- **unsure (2)**
- **seems-right (1)**
- **make-personal (1)**
- **none (1)**
- **larger-dictionary (1)**
- **good-method (1)**
- **starting-words (1)**
- **hard-remember (1)**
- **unused (1)**
- **only-if-easy (1)**
- **passwordbank-4 (1)**
  categorized (1)
- **passwordbank-6 (1)**
- **forgot-last-word (1)**
- **simple-words (1)**
- **funny (1)**
- **group-pairs (1)**
- **familiar (1)**
- **positive (1)**
  use-in-future (1)
- **nice (1)**
- **secure-enough (1)**
- **like-the-flow (1)**
- **simple (1)**
- **increase-dictionary-size (1)**
- **easy-remember (1)**
- **not-complicated (1)**
- **important (1)**
- **reorder (1)**
- **personal-connection (1)**
- **atypical-format (1)**
- **no-more-secure (1)**
  current-pword (1)
- **like-the-combination (1)**
- **unique-combo (1)**
- **needs-theme (1)**